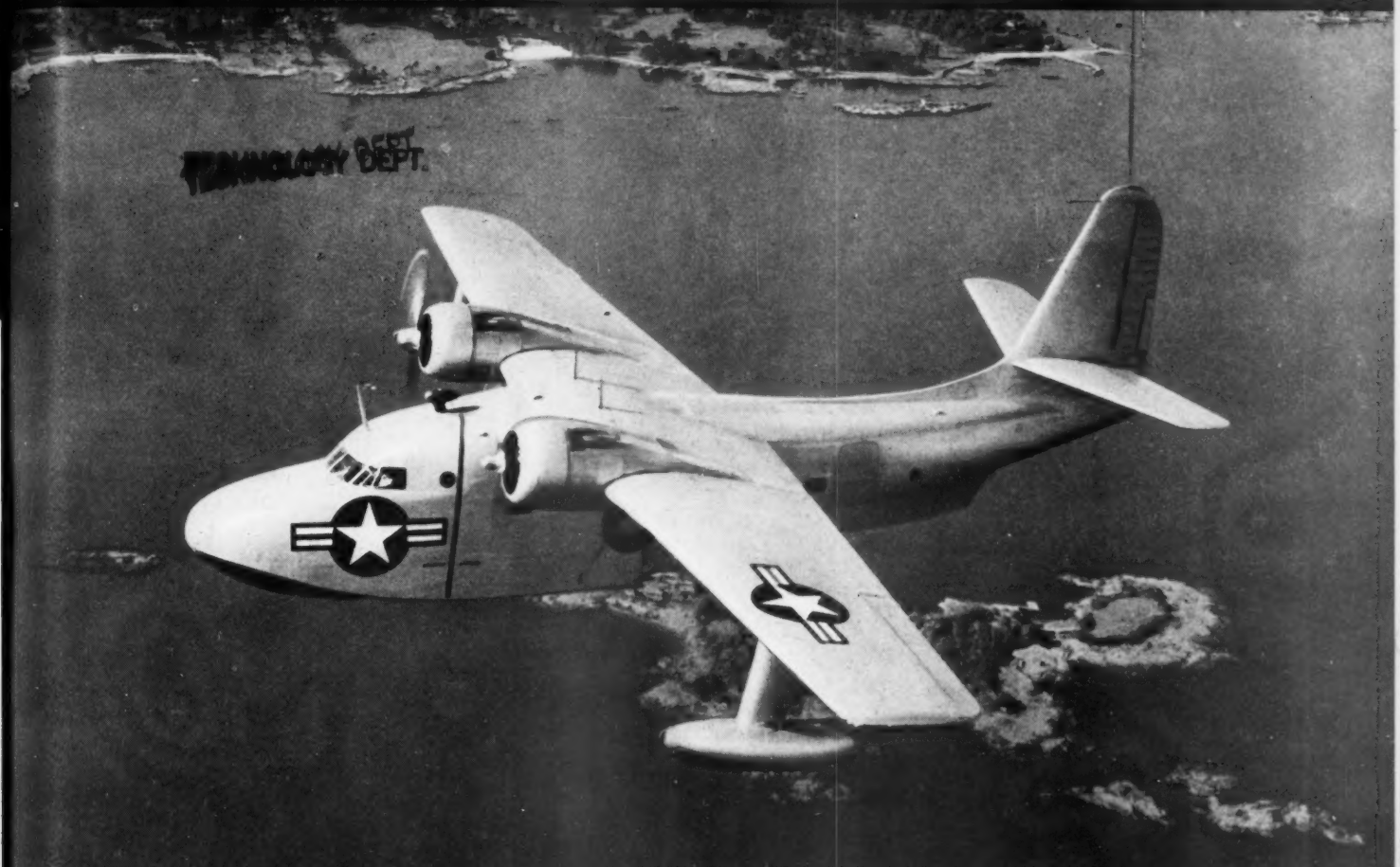
AVIATION WEEK

A McGRAW-HILL PUBLICATION

JULY 18, 194

TECHNOLOGY DEPT.

DETROIT



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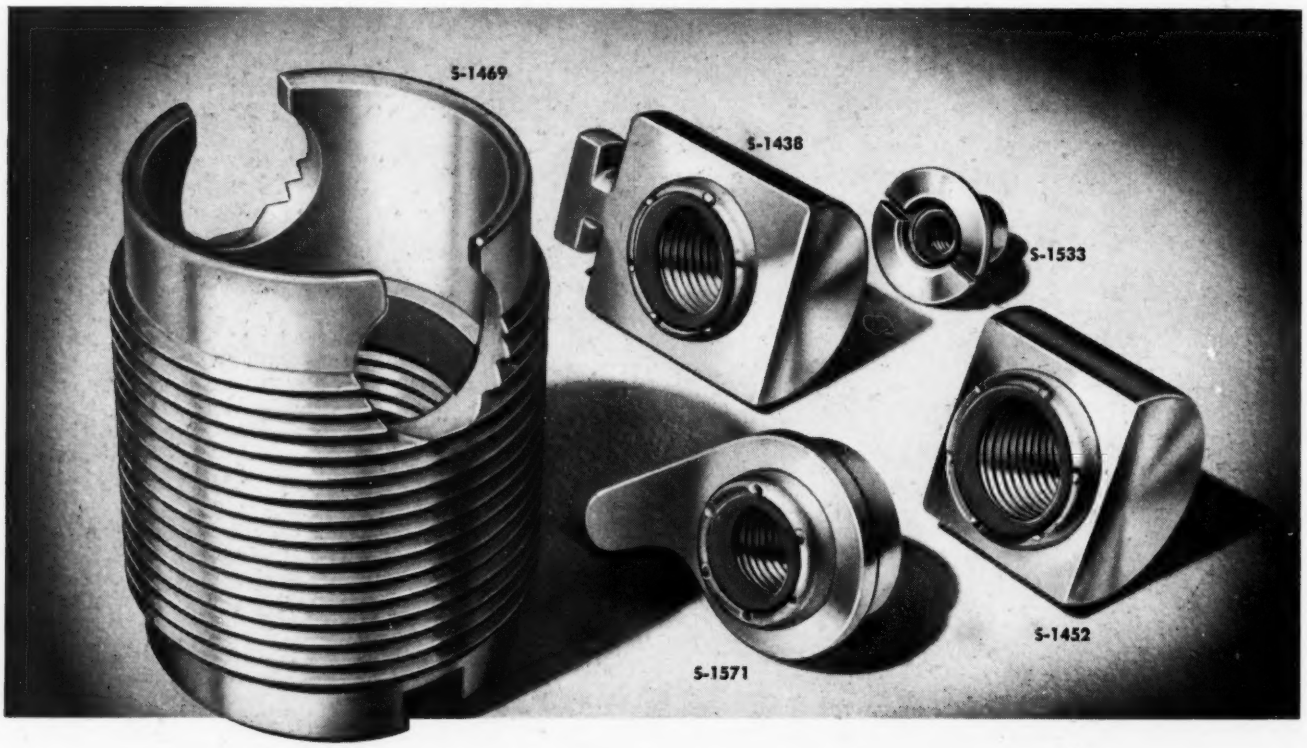
Fastener Problems complicated by space limitations

OVERCOME WITH ESNA SELF-LOCKING FITTINGS



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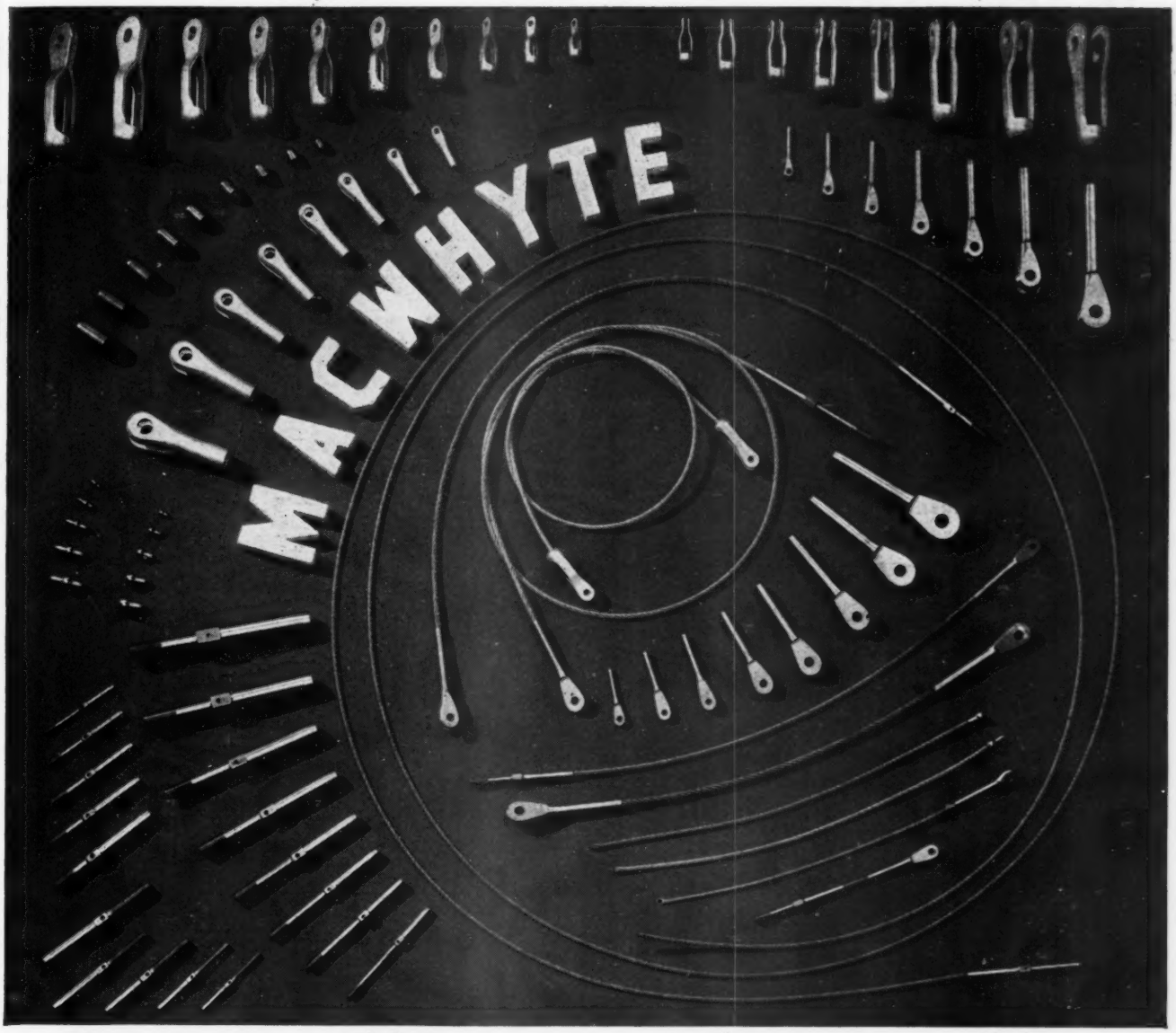

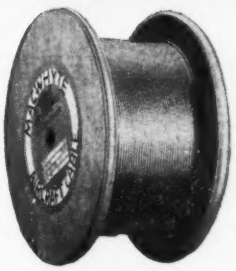

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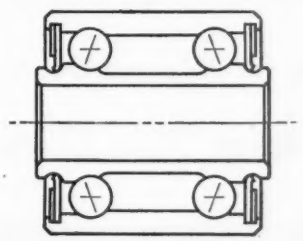

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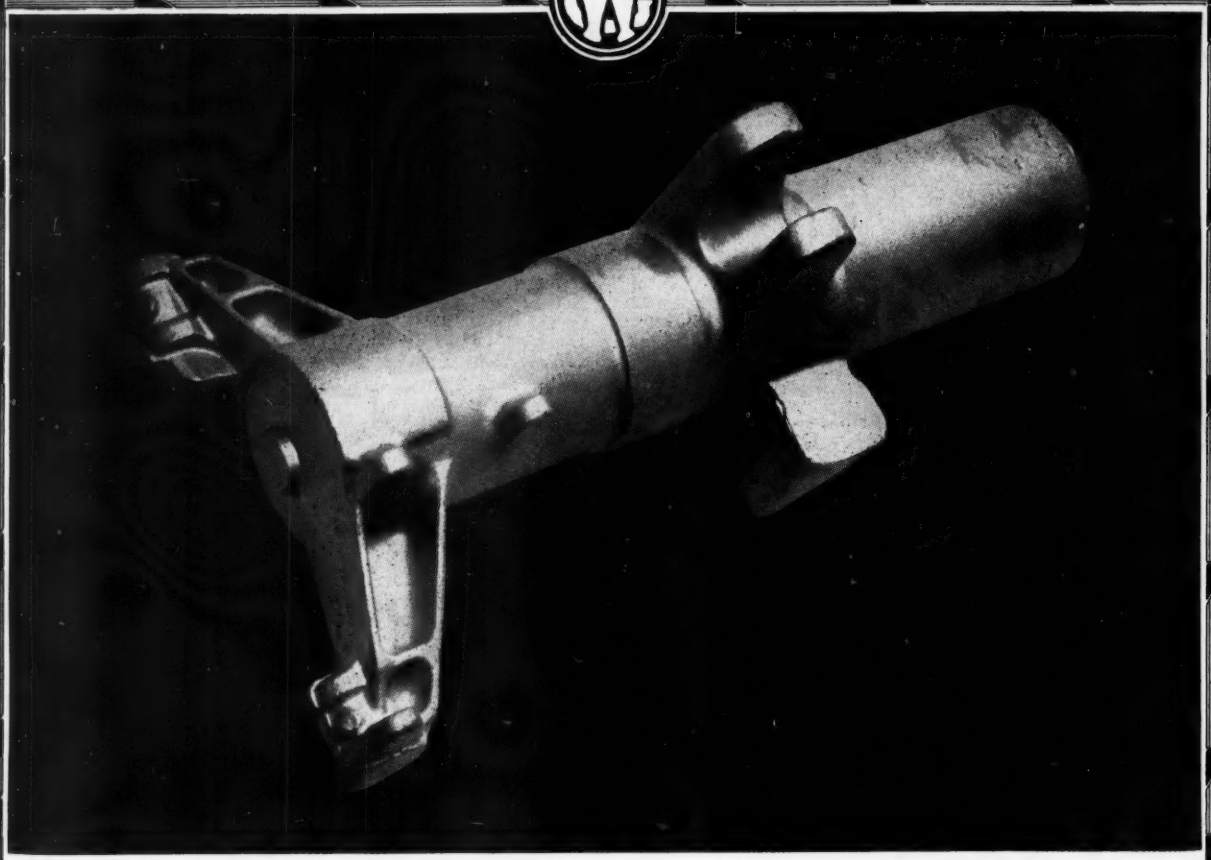

Aircraft Landing Gear Forging—Weighing 275 pounds, this part is typical of the many large intricate forgings required on military and transport aircraft. Wyman-Gordon has specialized in aircraft forgings since the beginning of the aviation industry, and today produces the largest volume of the greatest variety of these important parts—forgings from five to one thousand pounds. And—there is no substitute for Wyman-Gordon experience.

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NEWS SIDELIGHTS

AAF Claims

Some sobering cold water is doused on wartime Eighth Air Force claims regarding its prowess against the German Air Force in the second volume of the semi-official History of the Army Air Forces in World War II. Written by AAF historical officers under official auspices, the book notes that preliminary sampling of captured German Air Force records indicated that "Eighth Air Force claims were far more exaggerated than even their severest critics assumed."

Prime example: the Schweinfurt mission of Oct. 14, 1943, when 60 of 291 Boeing B-17s dispatched on the mission were shot down by German fighters. Eighth Air Force claimed 186 German fighters destroyed. GAF records show that only 38 fighters were lost in all combat for that day.

The Schweinfurt mission concluded six attempts by the B-17s to penetrate Germany without fighter escort. Total of 148 B-17s were lost mostly to enemy fighter action and control of the air was definitely lost to the GAF until early in 1944, the history concludes. The historians say that discrepancies between AAF claims and German records are so wide that they raise fundamental questions regarding evaluation procedures of the AAF.

Progress Report

Proposed legislation specifying peacetime procedures for military contract terminations has now been cleared by the National Military Establishment and is before the Bureau of the Budget. Chances for introduction at the present session of Congress are slim. With approximately $326 million in cancelled USAF contracts and a smaller amount of naval aircraft shifts, speed-up of the bill through Congress will be necessary before either USAF or Navy can properly balance their procurement books and manufacturers know just where they stand financially on the cancelled contracts.

Loan Deadlock

Sen. Edwin Johnson (D., Colo.), chairman of the Senate Interstate and Foreign Commerce Committee with jurisdiction over the Civil Aeronautics Board, and Sen. William Fulbright (D., Ark.), chairman of a Banking and Currency subcommittee with jurisdiction over the Reconstruction Finance Corp., are deadlocked over how to assure repayment of RFC loans to airlines.

Johnson wants RFC to appoint a director to the board of each carrier with RFC indebtedness. Fulbright wants the 1938 CAA Act amended to remove the requirement for CAB approval of RFC loans. "This would mean that loans would be made to airlines on a straight business basis, without the implication that CAB would be obligated to protect them through mail pay," Fulbright told AVIATION WEEK.

Johnson is vigorously opposed to this, commenting that "CAB is the expert on airlines and, of course, should be consulted by RFC." Fulbright is lukewarm to the Johnson proposal. Johnson's proposal, relating to RFC policy, comes under Fulbright's subcommittee, and Fulbright's proposal comes under Johnson's committee.

Jobs Vacant

Three $10,000 a year aviation jobs are still vacant with no immediate prospects of their being filled. They are: assistant secretary of the Air Force—vacated by C. V. Whitney when he moved to Commerce Dept.; assistant secretary of commerce for aeronautics—left open when John Alison became president of Transit Van Corp.; and the new post of executive vice president of the Air Line Pilots Assn.

Damon Speaks Out

Ralph S. Damon, former American Airlines president and now president of TWA, has disclosed the inside story of why C. R. Smith called on his directors to give speedy approval late last year to the American Overseas Airlines-Pan American Airways merger pact. According to Damon, Smith indicated that Howard Hughes had given Floyd Odlum power of attorney to sell TWA's international routes and that Odlum even then was trying to contact PAA president Juan Trippe.

Smith reportedly suggested that if TWA sold out its international division to Pan American first, American could not get as good a price for American Overseas. Noah Dietrich, Howard Hughes' assistant, last month denied Hughes gave power of attorney to anyone to negotiate with Trippe.

Damon said that prior to his resignation from American over the merger deal, he had been disappointed by his inability to get C. R. Smith, then AA board chairman, to back actively a company-wide economy program. In 1948, Damon declared, AA seemed to be spending too much money for equipment and manpower.

Although negotiations with PAA for sale of American Overseas began early last October, Damon said Smith did not inform him of the deal until more than a month later. When finally told about it, he asked Smith: "This is a joke, isn't it?"

John E. Slater, former AOA board chairman, who also resigned because of the merger deal, wasn't told about it until even later. Both Slater and Damon felt that the approximately $19 million dollars Pan American is offering for American Overseas is an absurdly low price to pay for the money-making company.

Squeeze on National

Eastern Air Lines president E. V. Rickenbacker believes Pan American Airways pulled a "squeeze" on National Airlines during negotiations earlier this year on a stock sale and equipment interchange agreement whereby PAA and W. R. Grace & Co. will acquire control of NAL if CAB approves.

While Trippe was negotiating with NAL president G. T. Baker, a PAA director called on Rickenbacker and said he was opposed to the Pan American-National-Grace deal. According to Rickenbacker, the director said PAA would have to invest several million dollars to strengthen National and suggested EAL and PAA might get together.

He reportedly suggested that PAA and EAL buy 100,000 shares of each other's stock and have "outside representatives" on each other's board of directors.

Rickenbacker said he was not interested in that, but the EAL head agreed to discuss equipment interchange with PAA. These discussions were broken off abruptly when Trippe phoned Rickenbacker that PAA and NAL had signed an interchange pact.

When Rickenbacker next met Baker he said he felt PAA had used EAL as a pawn. Baker replied: "Well, you were right, because Trippe told me if I didn't agree to an interchange, he was in a position to make a deal with Rickenbacker—it's either with you or him." Of Trippe, Rickenbacker declared, "He and I never see eye-to-eye on anything."

AVIATION CALENDAR

July 19-20—National Assn. of State Aviation Officials board of directors meeting, Grand Hotel, Mackinac Island, Mich.

July 20—National Aircraft Standards Committee eastern division meeting, Cleveland Hotel, Cleveland, Ohio.

July 21—Air Cargo Clinic, sponsored by Aviation Committee, Oklahoma City Chamber of Commerce, Convention Hall, Skirvin Tower Hotel, Oklahoma City.

July 21-22—IAS annual summer meeting, IAS Building, Los Angeles.

July 26-27—Air Force-Navy-industry meeting on revision of ANS-52A (machine screw), Tempo "U" Bldg., Wash., D. C.

Aug. 6-7—Second annual International Air Fair sponsored by Aero Club of Michigan, Willow Run Airport.

Aug. 6-14—1949 West Coast soaring championship, Palmdale Airport, Calif.

Aug. 7-14—Second annual southwestern soaring contest, NTAC airport, Grand Prairie, Tex.

Aug. 22-23—ARTC, western division meeting, Boeing plant, Seattle, Wash.

Aug. 25-28—Flying Farmers national convention, Fort Collins, Colo.

Aug. 29-Sept. 1—Aeromedical Assn. annual meeting, Statler Hotel, N. Y.

Sept. 1-7—International conference of Federation Aeronautique Internationale, Wade-Park Manor, Cleveland, Ohio.

Sept. 3-5—1949 National Air Races, Cleveland, Ohio.

Sept. 6-8—Annual spark plug and ignition conference, sponsored by Champion Spark Plug Co., Hotel Secor, Toledo, Ohio.

Sept. 7-11—10th Society of British Aircraft Constructors flying display and exhibition, Farnborough Airfield, Hampshire England.

Sept. 9-12—Clinic on maintenance of industrial instruments, Instrument Society of America, Statler Hotel, St. Louis.

Sept. 18-20—International Northwest Aviation Council convention, Spokane, Wash.

Oct. 5-8—SAE national aeronautic meeting and aircraft engineering display, Biltmore Hotel, Los Angeles.

Oct. 30-Nov. 2—Annual convention, National Assn. of State Aviation Officials, New Orleans.

Nov. 9-11—Seventh annual meeting, Aviation Distributors and Manufacturers Assn., French Lick Springs Hotel, French Lick, Ind.

Jan. 13-15, 1950—All-American Air Maneuvers, Miami.

PICTURE CREDITS

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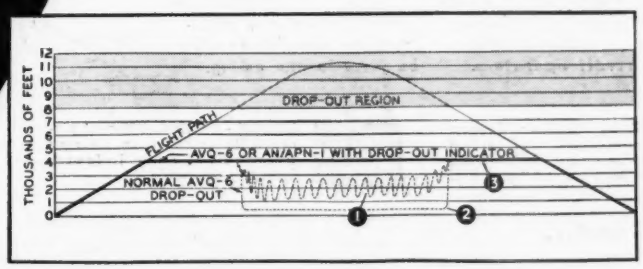
Positive drop-out indication and "Fail-Safe" warning . . .

Altitude chart showing behavior of radar altimeter indicator-meters with respect to flight path of the airplane. For the purpose of illustration, drop-out point is shown at 8000 feet. Curves illustrate: (1) the wild fluctuations which characterize the AN/APN-1 in the drop-out region; (2) the practically complete normal drop-out of the AVQ-6; and (3) the action of the AVQ-6 or the AN/APN-1 with the RCA Drop-Out Indicator.



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The new DROP-OUT INDICATOR, Type AVA-133, can be added to old or new equipments

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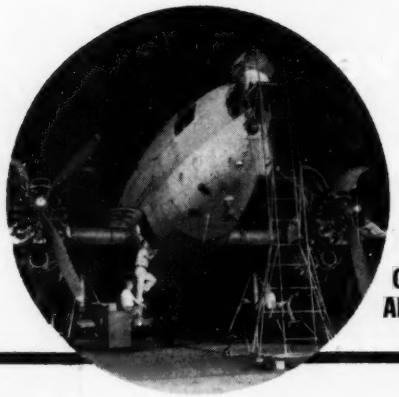

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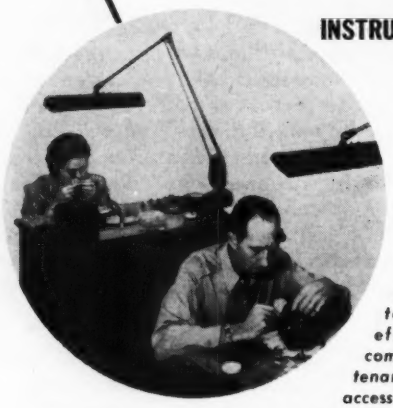

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NEWS DIGEST

DOMESTIC

Paul B. MacCready, Jr., 23, of Weston, Mass., won the 16th National Soaring Contest at Elmira, N. Y. He flew a Polish-built Orlik sailplane.

Andre B. Shea, director and senior vice president of W. R. Grace & Co., became president of Panagra when Harold J. Roig retired.

Rex B. Beisel resigned as United Aircraft Corp. vice president and general manager of its Chance Vought aircraft division in Dallas. Frederick Detweiler, assistant general manager, is acting general manager.

Lt. Gen. Barton K. Yount (Ret.) wartime commander of the Army Air Force Training Command, died at Phoenix, Ariz. He was 65.

XHJP-1, Piasecki-built Navy helicopter, will become the HUP-1 as it enters production, under a Navy Bureau of Aeronautics specification.

American Society of Mechanical Engineers has nominated James D. Cunningham of Chicago for its 1950 president.

A. M. "Tex" Johnson, for six years test pilot for Bell Aircraft Corp., has joined Boeing Airplane Co. as an engineering division flight test pilot assigned to the XB-47 Stratojet test program.

Pickets for truck drivers striking against Willis-Rose Corp., fueling agency at New York International Airport, halted hangar construction work by stopping cement, fuel and equipment drivers at entrances to the field.

FINANCIAL

Curtiss-Wright Corp. has accepted 446,652 shares of common stock for purchase from stockholders. Prices ranged up to $9.75 a share. Total was $4,750,727 for the six months to May 31.

INTERNATIONAL

England's Bristol Aeroplane Co. postponed for at least two and possibly three months the first flight of the giant eight-engined Brabazon civil transport, originally set for late May or early June.

Canadian Air Transport Board's chief research aeronautical engineer has been named deputy director-general of the Canadian Defense Research Board at Ottawa.

Pakistan and Australian governments have concluded a formal air transport agreement, involving Qantas Empire Airways and a Pakistan airline, when it begins operations.

INDUSTRY OBSERVER

►Curtiss-Wright and Douglas are doing preliminary design studies for the Navy on a turbojet-powered 65,000 lb. attack bomber for operation off the Midway-class carriers (AVIATION WEEK, July 11).

►Big transport manufacturers (Boeing, Convair and Douglas) are trying to interest the Air Force in tanker versions of their current transports C-97A, C-99 and C-124A. Since aerial refueling of both fighters and bombers looms as a major USAF requirement the market for a good aerial tanker now looks promising.

►Boeing has developed its own refueling system to go with a tanker version of the C-97A. Instead of the gravity feed through a flexible hose making tail to tail contacts (British system now used by USAF), the Boeing system uses large diameter boom extending from the tanker's tail to the receiver's nose. Contact is made by a refueling technician housed in a blister under the C-97A tail. This technician controls movable airfoils on the tip of the refueling boom that enables him to "fly" the boom into the contact point on the receiver. Fuel is pumped through the boom under pressure enabling a much more rapid transfer of fuel than by gravity feed. C-97A could carry between 6500-7000 gal. of fuel cargo. Boeing subcontractors are now modifying B-50 nose assemblies to take the new-type of refueling equipment and USAF is expected to announce an order for C-97A tankers shortly.

►Glenn L. Martin Co. is nearing completion of the prototype XB-51, a triple-jet light bomber with a sweptback variable incidence wing. Prototype is scheduled to fly in September. The XB-51 is powered by three General Electric J-47 engines, two housed in wing nacelles and the third buried in the fuselage with flush air inlets on both sides.

►Boeing tractor gear now flying on a B-50 is also being considered for the Convair B-36 bomber and the Douglas C-124A transport. Biggest bug still to be licked in the tractor gear is keeping dirt and rocks from becoming fouled with the rollers inside the rubber tread just after landing impact.

►A. V. Roe of Canada has completed the airframe of its jet airliner (C-102) and hopes to make initial flight of the prototype in August. Four Derwent jet engines to be used in the C-102 are now undergoing final testing before installation.

►Air Force is experimenting with delayed opening parachutes to bring recording instruments safely to the ground from an altitude of 100 miles. The instruments are contained in the warhead of V-2 rockets now being used for upper atmosphere research. Initial 30-ft. pilot parachute carries the detached warhead from 100 miles down to about 50 miles. Increasing density of the atmosphere around 50 miles causes the pilot chute to fully open, dragging out the main 100-ft. chute, which carries the instruments to the ground.

►Bell Aircraft Corp. X-2 rocket powered research plane is now scheduled to make its initial flights next January. The sweptwing stainless steel plane powered by a Curtiss-Wright rocket engine will be used to explore the transonic speed range between Mach .9 and Mach 2.

►Stanley Aviation Corp. of Buffalo has an Air Force contract to design and install a prone pilot's cockpit in a Lockheed F-80 jet fighter. The pilot will lie on his stomach stretched out on a nylon bed installed in Plexiglas nose. Aim of the prone position is to enable the pilot to take more Gs in high-speed maneuvers than is possible in a conventional sitting position.

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AVIATION WEEK

July 18, 1949

Gag Issue Raised on Eve of B-36 Probe

Johnson direction to "coordinate" inquiry data provokes congressional scrutiny.

The question as to whether Secretary of Defense Louis Johnson attempted to gag top level officials of the military establishment in the coming congressional investigation of the B-36 touched off fireworks last week on Capitol Hill.

Johnson is the central figure in the investigation which Chairman Carl Vinson (D., Ga.) of the House Armed Services Committee hopes to get underway July 26. The probe resulted from a speech on the House floor by Rep. James Van Zandt (R., Pa.), a Naval Reserve captain (AVIATION WEEK, June 6). The Pennsylvanian called for an examination of "ugly reports" that the Air Force's decision to concentrate procurement on the Consolidated Vultee Corp. B-36 strategic bomber was influenced by Johnson, a former director of the corporation and fund raiser for the Democratic party in last year's election.

▶ **Charges Denied**—Johnson and Secretary for Air Stuart Symington, also mentioned in the Van Zandt speech, denied Van Zandt's statements and welcomed the investigation (AVIATION WEEK, June 13). House Armed Services Committee broadened the probe to embrace all aspects of the Naval aviation versus USAF issue, including Johnson's cancellation of the 65,000-ton supercarrier, United States.

Developments last week were:

• **Van Zandt disclosed** two department memoranda showing that Johnson had directed that all official testimony from the National Military Establishment for the B-36 investigation be cleared through his office before being submitted to the House committee.

• **The committee** promptly "postponed" action, by a 13 to 12 vote, on legislation, already passed by the Senate, tightening the Secretary of Defense's hold on the National Military Establishment. Rep. Dewey Short (R., Mo.) commented: "If this bill were passed Johnson would be able to muzzle the committee's witnesses."

• **Chairman Vinson announced** he would take steps to assure "a free investigation," commenting, "we are not going to permit any chaperoning of witnesses."

• **Johnson issued a statement** asserting that the memoranda were issued "for the sole purpose of expediting the work of the National Military Establishment in its effort to cooperate with the House Armed Services Committee. . . ."

▶ **Johnson Memos**—The first memorandum was signed by Johnson and addressed to the secretaries of Army, Navy, and Air Force, the Joint Chiefs of Staff, the chairman of the Munitions Board, the chairman of the Research and Development Board, and the director of the Weapons System Evaluation Group. Dated June 20, it stated:

"Confirming arrangements we have heretofore discussed, Under Secretary (Stephen) Early has been designated to coordinate the work of the National Military Establishment in connection with the investigation . . . Accordingly Mr. Early is to be kept informed of all activity and information connected with the investigation before action is taken."

▶ **Second Memo**—The second memorandum, addressed to the same officials was by Early. Dated June 24, it stated:

"Most of the departments and agencies of the National Military Establishment have received from Mr. Vinson requests for views on different aspects of the investigation . . . Conversations with Mr. Vinson by the staff of this office have resulted today in an agreement . . . to permit the departments and agencies to postpone the submission of their views until July 15 . . . Drafts of the proposed replies should be sent to this office, attention of Mr. Felix Larkin by July 8, in order that such coordination as is needed may be effected prior to the July 15 deadline."

Johnson countered that the memoranda were "designated to insure that the maximum amount of information would be made available to the committee in the shortest possible time," explaining that:

"Legislation provides for quarterly reports to the Congress of the amounts of contracts let for aircraft procurement and, to comply with these provisions, procedures were established by (the late) Secretary (James) Forrestal with the approval of the President. Under these procedures, aircraft contracts were examined by the office of the Secretary of Defense, the Munitions Board, the Research and Development Board and, on certain occasions, by the Joint Chiefs of Staff, in addition to the Bureau of the Budget. The recent contracts for B-36 aircraft were subject to these procedures and all of the records concerning these contracts are therefore not to be found in any one department or agency.

"To insure that the full record of all agencies and departments will be available to the House Armed Services Committee, it was therefore necessary that responsibility be placed in a single person. Unless this procedure were adopted, the National Military Establishment could not be sure that the committee would get all the information it wanted, completely and promptly.

"There was not, and is not now, any intention of censoring the statements of any department, agency, or individual in the National Military Establishment in connection with this inquiry."

▶ **Attorneys Named**—Two other important developments on the investigation were:

• **Appointment of Joseph Keenan,** former assistant attorney general who directed the prosecution for the Japanese War Crimes Commission, as chief counsel. James Gillin and Solis Horwitz, who assisted Keenan in that prosecution, will be his assistants. Committee members, including Van Zandt expressed hearty approval of the appointments.

• **Engagement of Prof. W. Barton Leach** of the Harvard Law School by USAF to prepare its case for the investigation. He is a colonel in the USAF Reserve.

▶ **Bill Future Dim**—The House committee's postponement of action on the Tydings Bill strengthening Johnson's control over the military establishment probably means that it will not be enacted at this session. Johnson has estimated that it would make it possible for him, through consolidations in department activities, to reduce the annual military budget by $1.5 billion.

The President, empowered to reorganize the executive branch under the recently-passed Reorganization Act, however, may accomplish the provisions of the measure.

▶ **Points at Issue**—Even before Van Zandt's disclosure of the memoranda, there was strong opposition in the House Armed Services Committee to the measure, sponsored by Sen. Mallard Tydings (D., Md.), chairman of the Senate Armed Services Committee. The main points at issue were:

• **Joint Chiefs of Staff.** The Senate bill provided for a chairman of the Joint Chiefs of Staff who would be the nation's top military officer. He would be the director representative of the Secretary of Defense. House committee-

men adopted an amendment under which the chairman would function largely as a liaison messenger to the Secretary. He would retain his regular rank, leaving the three Chiefs of Staff as the nation's top military officers.

• **Secretary of Defense.** The Senate measure would give the Secretary sweeping authority to consolidate, transfer, and coordinate the activities of the military organization, with one restriction. He could take no action which would result in a change in the combat missions of the three services, laid down in the 1947 Unification Act. Measure would also permit inter-service personnel transfers approved by the transferee and the service from which and to which he would be transferred. House committeemen proposed an amendment which would require the Secretary to consult the House and Senate Armed Services Committees before making any consolidations or changes in the activities of his department. They also urged that all inter-service personnel transfers be barred.

• **Service Secretaries.** The Senate measure would bar the three service secretaries, in their official capacity, from proposing legislation or taking up department matters directly, over the head of the Secretary, with the President and the Congress. House committee members called for a stipulation explicitly authorizing the service secretaries to confer with congressmen and recommend legislation directly, after notifying the Secretary.

C-46 Crash Hurts Nonsked's Cause

Nonscheduled passenger airlines last week were in perhaps their toughest spot. They have been cold-shouldered by the Civil Aeronautics Board, and the crash of a Standard Airlines C-46 seemed likely to alienate what public and Congressional sympathy the nonskeds have been able to arouse.

The Standard crash near Burbank, Calif., which by midweek had been fatal to 34 of the estimated 48 persons aboard, came ten days before the line was supposed to cease operations under a CAB order issued last month. The order was on economic grounds, not safety, and CAB says nonsked safety regulations are about as tight as those for scheduled carriers.

But the Standard and recent Puerto Rico crashes killed at least 89 within a month and a half. By the middle of last week, there had been no fatal accidents on scheduled U. S. domestic or international airlines since last August.

Meanwhile, preliminary investigation of the Standard accident had established no connection between the crash and the reported fight aboard.

BOUTELLE: Real day came last week.

Fairchild Shift

Ward resigns as new slate of directors wins three-month fight.

Fairchild Engine & Airplane Corp. was under new management last week. Richard S. Boutelle officially was elected president at the resumed annual meeting in Hagerstown, Md., ending a stockholders' battle which began nearly three months ago.

It was a personal triumph for Boutelle, as well as for Sherman Fairchild, corporation founder, who began and led the fight that ousted the corporation management headed by Chairman J. Carlton Ward, Jr. A few weeks ago, Boutelle, then a director and vice president, was fired because he sympathized with Sherman Fairchild's views.

His ouster came a few days before Hagerstown division employes celebrated "Boutelle Day," honoring him for his direction of the plant. Boutelle had his real day last week.

► **Two-to-One**—After twice having caused postponement of the annual meeting by persuading stockholders to withdraw proxies given to management, Sherman Fairchild agreed to permit a vote at the meeting July 6. It was two days before the results were in: 1,813,403 shares voting; 1,191,217 for Sherman Fairchild's "Stockholders Committee"; 622,186 for management.

But the result was no surprise by that time. Day before, one of the management's directors resigned, apparently realizing defeat was ahead. Day the results were announced, Boutelle temporarily took over direction of the meeting as Ward resigned as chairman and L. B. Richardson's tenure as president ended.

New chairman was expected to be James A. Allis, vice president of Grace National Bank, New York City. He was on both the management's and the stockholders committee's slates of directors.

► **Future**—Although Ward "elected to terminate" his employment contract—which was the center of the stockholders' fight—that doesn't end the new management's relations with Ward. Under terms of the contract, his resignation takes effect in six months. This makes the corporation liable for an estimated $60,000 in pay.

Richardson's future also is in doubt. It is expected he will be retained at full salary in a consultant capacity. No immediate sweeping changes are slated for other Fairchild employes. It is anticipated that both personnel and space in the New York headquarters will be reduced. But spokesmen for Sherman Fairchild's group believe analysis and reorganization will take about three months.

Race Postponed

The Beech-sponsored lightplane cross-country race (AVIATION WEEK, July 11) originally planned as a feature of the 1949 National Air Races at Cleveland has been postponed to the 1950 races.

The decision to postpone the race for a year was made by Beech Aircraft Corp. and National Air Races officials after it became apparent that it would be impossible to agree on all operational details of the race in time to receive entries for the 1949 event that was scheduled to be run on Sept. 3-4.

Details for the 1950 race are now under study by the contest committee of the National Aeronautics Assn. and agreement between Beech, NAA and racing officials on the 1950 event is expected sometime before the year's end.

KLM Starts Probe Of Crash in India

KLM Royal Dutch Airlines last week was investigating the second fatal crash within a month. A Constellation carrying U. S. and Dutch news men crashed on a hillside near Bombay, India, killing all 45 persons aboard. Late last month, a KLM Constellation fell into the harbor at Bari, Italy, with an estimated toll of 33.

Aboard the plane that crashed in

India was Thomas A. Falco, of the McGraw-Hill Washington news bureau. He was returning from the Netherland East Indies where he had been on special assignment for Business Week as a guest of the Netherland East Indies government. Twelve other noted U. S. news men were aboard the plane.

According to preliminary reports, the craft was en route from New Delhi to Bombay and was caught in a monsoonal rain before reaching its destination. The plane apparently struck the hill while circling and awaiting a break in the weather. Fire followed the crash.

Turnback Report

Engine failure that caused a Pan American Airways Stratocruiser to turn back to Shannon stemmed from a breakdown of an idler gear in the engine oil pump, a PAA investigation disclosed last week.

The plane was over the Atlantic bound from London to New York when the oil pressure dropped on the left outboard engine. The pilot cut off the engine, but was unable to feather the propeller, which windmilled. An oil fire started around the nose section of the engine but was extinguished by the airstream. The entire prop installation finally broke off.

Breakdown of the idler gear is reported to have led to other troubles which resulted in failure of the prop feathering system.

Within four days, two more Stratocruisers returned to their departure points, but both were pilot's choice, and not because they were unable to continue, Pan Am reports. Both were outbound from Idlewild, the first for London, the second for Bermuda.

The London-bound plane turned back because of a "rough" engine. Upon inspection no sign of malfunctioning was found and the plane took off again the following day. A turbosupercharger on the Bermuda-bound craft failed to operate and the pilot turned back rather than fly at a lower level in a storm area.

Maintenance Shifts to Civilians

Civilian maintenance contractors to the U. S. Air Force will get an increasing volume of military business during the fiscal year 1950.

Present plans of Military Air Transport Service and Air Materiel Command call for extension of cycled reconditioning and maintenance contracts to include all MATS transports and possibly some military transport types operated by other commands.

▶**$25 Million Item**—Preliminary estimates indicate that between $20 and $25 million will be spent by AMC on civilian maintenance contracts during fiscal 1950. About $15 million was spent during fiscal 1949 with Texas Engineering and Manufacturing Corp. (TEMCO), Lockheed Air Service Corp. and Transocean Air Lines for overhaul of 500 C-54 transports used in the Berlin airlift.

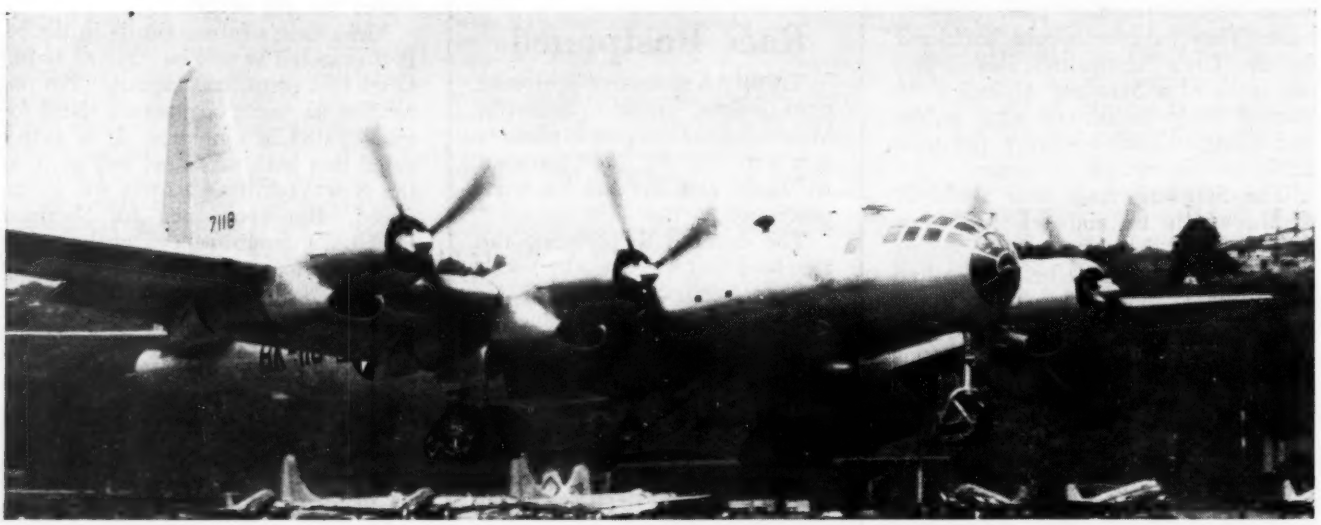
Shift in transport maintenance from AMC depots to civilian contractors reflects MATS evaluation of the civilian service performed on airlift transports as better, faster and about 25 percent cheaper than AMC depot work. AMC depots required an average of 140 days to turn out a reconditioned C-54 and some remained in depots as long as eleven months, according to MATS officials. In contrast, the three civilian contractors averaged 17 days per plane using two shifts of workers and 50 planes per month using a 40-hour week.

▶**AMC Establishment**—AMC operates eight overhaul depots employing 93,842 civilians and 14,567 military personnel. Total operating cost of AMC depots last year was $318,005,376. AMC depots are located at Middletown, Pa.; Wright-Patterson AFB; Warner-Robbins AFB, Macon, Ga.; Mobile, Ala., Ogden, Utah; Oklahoma City; Sacramento, Calif.; and San Antonio, Tex.

Maj. Gen. Charles B. Stone III is director of supply and maintenance for AMC with Brig. Gen. George Mundy as his deputy.

MATS officials give civilian maintenance contractors credit for keeping the Berlin airlift going during the critical months of last winter. They praised particularly the ingenuity and initiative displayed by the contractors in meeting unusual maintenance problems. For example TEMCO fabricated over 1800 C-54 parts required for rush repairs. All of the airlift C-54s have gone through the maintenance cycle once and some of them are on their second trip through the contractors' shops.

▶**Borrowed from United**—In establishing its own maintenance cycle MATS borrowed heavily on the techniques used by the old Naval Air Transport Service at Moffett Field, Calif. and United Airlines. Navy still reconditions its own C-54s at Moffett.



TRACK-TREAD GEAR FOR B-50

Top speed isn't affected by the track-tread gear on this B-50, shown taking off from Boeing Field, Seattle. Boeing-designed landing gear is being used in experiments to determine feasibility of using unimproved grass or dirt fields for operation of large aircraft. Gear is similar to that installed on Fairchild's Packet and consists of an endless rubber and steel-wire belt which rotates around a series of grooved drums and bogies. Single wheel under airplane is connected to speed indicator for ground test purposes and is not part of the landing gear, which is the largest of its type ever made and first of its type for heavy four-engine bombers.

During fiscal 1950 MATS plans to extend cycled reconditioning to its Lockheed C-121A; Douglas C-74; Boeing C-97; Fairchild C-82; Douglas C-47 and Sikorsky H-5 helicopters. Lockheed Air Service Corp. recently got a $341,000 contract for the C-121A work. First C-74 is now being overhauled by the Mobile Air Depot but it is planned to switch the C-74 work to Douglas. Specifications for overhaul of the C-97, C-82, C-27 and H-5 are till being prepared.

▶ **Carrier Demand**—Because of MATS outstanding success with cycled reconditioning USAF troop carrier groups are now making a strong effort to have their transports taken out of AMC depots and handled by civilian contractors.

During hearings of the President's Air Policy Commission in 1947 numerous operators of civil aircraft maintenance firms testified that they could do the work better and cheaper than AMC depots. Shortly thereafter USAF changed its plans on the reconditioning program for war surplus Boeing B-29s and shifted work originally planned for Glenn L. Martin Co. and Bell Aircraft Corp. to AMC depots on the grounds of "military security." Boeing continued to do B-29 reconversion at Wichita.

Turbojet Viscount Nears Completion

(McGraw-Hill World News)

LONDON—Vickers-Armstrongs Ltd. is completing the second prototype of the Viscount, with two Rolls-Royce Tay turbojet engines instead of the four Dart turboprops which powered the first prototype.

Construction is well advanced and it is hoped that flight trials will begin before the end of the year. The aircraft is being built for the Ministry of Supply, not as a potential airliner but solely for research and development purposes. No further details of the Tay engine may be given at present. This installation in the Viscount will be its first appearance on the scene.

Meanwhile, the first Viscount prototype, which completed the initial phase of its flight trials in May, is being fitted with its pressurization system. The interest which has been shown in the Viscount by airline operators from all parts of the world has been intensified in recent weeks, especially since the announcement of the Viscount 700, an enlarged version capable of carrying 40 or 53 passengers. This development has been made possible by the increased power of the Rolls-Royce Dart RDa3 propeller turbine engines. Work was begun some time ago on the first of the 700s, but flight date is still indefinite.

Industry Due for Tax Windfall?

New Internal Revenue ruling on prewar earning base for wartime excess profits tax may mean big refunds.

The aircraft industry may recover millions of dollars in refunds on excess profits taxes as a result of a recent ruling of the Bureau of Internal Revenue. The new ruling applies only to excess profits taxes paid on earnings made during the wartime period.

Acting through its Excess Profits Tax Council, the Bureau has defined the circumstances under which certain corporations can recompute their "normal" prewar income. If the recalculated "normal" income turns out to be higher, wartime excess profits would automatically be cut back and refunds would be in order.

▶ **War Problem**—BIR's ruling is part of a broad effort to do right by taxpayers who were unfairly treated by the routine operation of the government's excess profits tax.

One of the most glaring inequalities: the excessive burden which the tax put on companies just beginning to cash in on long, lean years of profitless development work.

To ease the burden, Congress authorized BIR to set up the Excess Profits Tax Council.

The job laid out for the Council: to reconstruct—on the basis of the peculiar factors in each case—what normal prewar income would have been if (A) the war had not happened along; and (B) the company had grown to maturity by 1936.

▶ **$5 Billion Claimed**—As of June 30, 1948—the latest date for which figures are available—more than 51,000 claims had been turned over to the Council for processing. The amount claimed is $5.6 billion.

About one-half these cases have been disposed of. But since the Council has tended to tackle the smaller claims first, the total involved has been reduced by only $1.1 billion. The Council still has about $4.5 billion more to go.

Claims are still coming in, but the final figure isn't likely to get much higher.

The statute of limitations prevents filing of refund claims more than three years after a tax return has been submitted. And since the excess profits tax was repealed in 1946, the deadline for filing is only a few months away.

▶ **Factor Considered**—To show the kind of factors that might be considered in recomputing "normal" prewar income, the Council's ruling cited the case of the hypothetical P corporation. The P corporation was organized in 1926 to manufacture aircraft. Until 1934, its activities were primarily confined to research and development; sales were limited to custom-built planes.

During 1934, however, the company offered two types of plane for general sale—one military, the other suitable for either military or commercial operation.

Through 1938, sales of successively modified and improved versions were made only to the U.S. Army and domestic airlines.

▶ **Foreign Orders**—But in April, 1939, P signed a contract with Great Britain for the speedy manufacture of 150 planes of its wholly military model. Seven months later, after the shooting started, the number was upped to 350. Britain agreed to foot most of the bill for the necessary expansion of P's facilities.

Over the years, P's output had risen from seven planes in 1934 to 184 in 1939. It's profits rose accordingly.

	Commercial-Military Type	Military Type Sold Domestically	Military Type Sold Abroad	Total Planes Sold
1934	1	6		7
1935	18	12		30
1936	32	15		47
1937	38	14		52
1938	51	35		86
1939	65	95	24	184

Under the law, P had to average profits for the years from 1936 to 1939 in computing its normal prewar income base for excess profits tax purposes. But P was still growing during this period. To include earnings for, say, 1937 would have pulled this average down far below the 1939 level.

▶ **Code Amended**—Recognizing this growth factor, Congress amended Section 722 of the Internal Revenue Code in 1942 to permit companies in P's position to use only 1939 earnings in computing its normal prewar profits base.

Reasoning was that P:

- Was successively changing the character of its business immediately prior to and during the base period—by introducing new products, by entering the foreign market, by expanding its facilities.
- Its modified business had not yet reached the peak of its earning power.
- A more realistic level of earnings would be reached by assuming that the company would have reached maturity two years later—1941—if the war hadn't intervened.

The Council, in general, tended to

accept these arguments. But its ruling was carefully fenced in with major qualifications.

Council said that the impact on profits of orders that stemmed directly from the outbreak of war should not be figured in computing the prewar base. For another, even orders that came from the U. S. Army in, say, 1938, as a result of international tension should not be reckoned. In other words, orders in preparation for war were as abnormal as war orders themselves.

▶ **Council Attitude**—Here is how the Council said P could logically figure what normal orders—and the profits they reflect—would have been if the company had reached maturity prior to 1939. P. could use its actual 1939 earnings as an excess profits tax base. But this figure would have to be shaved down somewhat. Here's why:

• Actual U. S. Army orders for military planes reflected the international tension that was a prelude to war and as such, were a war factor. In other words, if not for the war P would probably have built no more than 60 planes for the Army—instead of 95.

• P's earnings on the 24 British planes made in 1939 would have to be excluded from normal profits—on the grounds that they are directly due to the war.

• Since commercial air transportation was gaining increasingly greater acceptance in 1939, it seems likely that P could have sold about 75 planes a year before its sales peak would have been reached. Actually, in 1939, it sold 65.

Net result is that P's normal prewar level of earnings lies somewhere between the four-year average (1936-1939) originally required by the law and the 1939 level for which P petitioned.

This kind of formula cannot be applied in exactly the same way to all other corporations that were still growing when war came; it probably isn't even applicable in the same details to all other aircraft companies. In each case, the Council will have to tailor the underlying principles to fit each particular set of circumstances.

That's why one BIR official said "I'd be happy to live just as long as it takes to process the last of these excess profits refund claims."

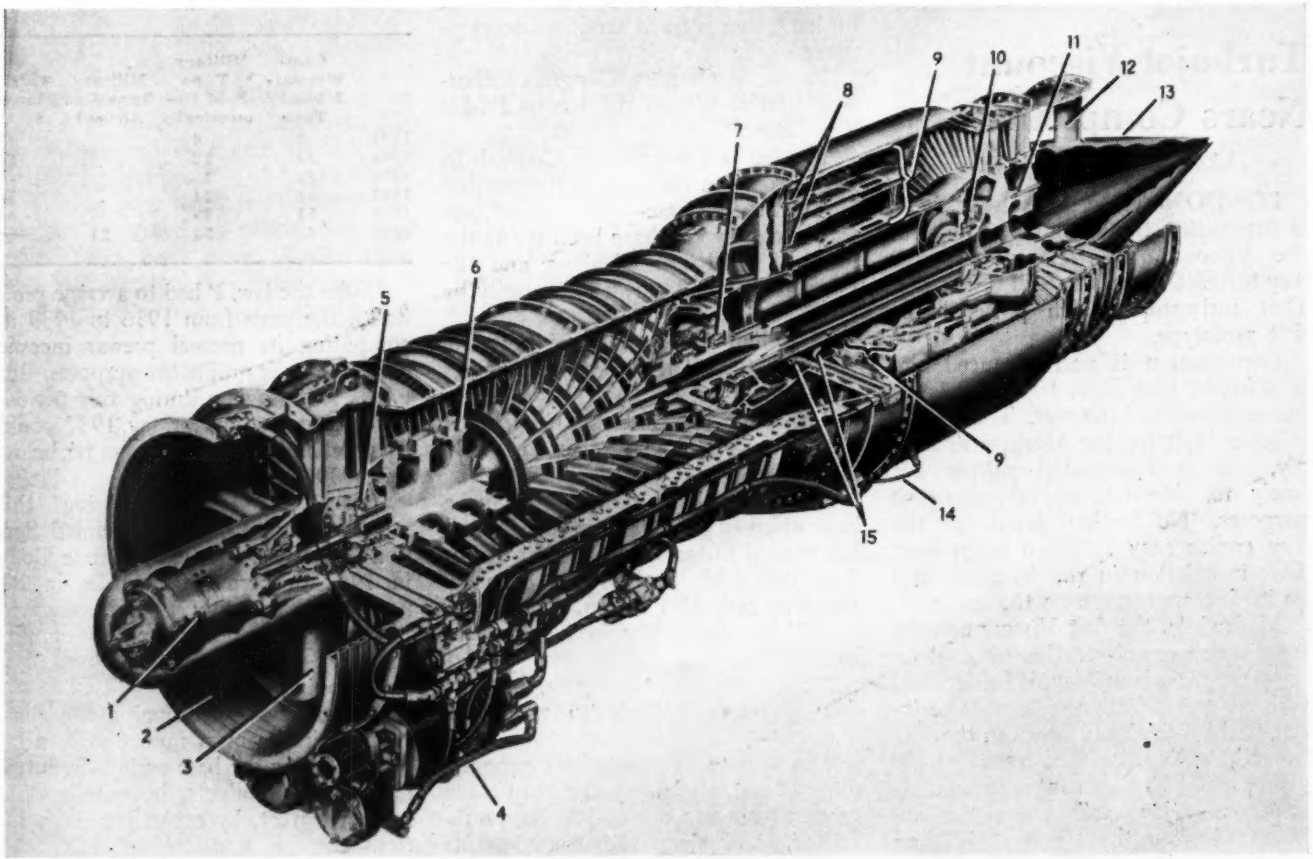
NACA Funds

House cut in money for construction upheld by Senate committee

National Advisory Committee for Aeronautics' $36.5 million construction program for fiscal 1950, contemplating major transonic wind tunnel development, (Aviation Week, June 20) faces sharp curtailment.

This was made virtually certain last week when the Senate Appropriations Committee restored only $100,000 of the $16.5 million House slash in funds for the NACA program. The $20.1 million ($10.1 million cash and $10 million contract authorization) allowed by the Senate group compared with the $20 million ($10 million cash and $10 million contract authorization) approved by the House after its examination of the NACA program.

▶ **Budget Request**—Budget Bureau originally requested $15 million cash and



INTERNAL MAKEUP OF J-34

First published details of Westinghouse J-34 jet engine, which develops more than 3000 lb. thrust. It powers Navy's McDonnell F2H Banshee, Chance-Vought F6U Pirate and F7U Cutlass, and Douglas F3D Sky Knight, as well as Air Force's McDonnell XF-85 Goblin parasite and sweptwing XF-88 Voodoo. Features shown are: 1, starter motor; 2, oil cooler; 3, strut, also serving as housing for accessory drive; 4, accessories; 5, front bearing; 6, 11-stage compressor; 7, center bearing; 8, fuel injection nozzles; 9, combustion basket of double annular construction, with crimped portion and holes for bleed-cooling air from compressor; 10, rear bearing; 11, two-stage turbine; 12, support strut; 13, cone; 14, ignition harness; and 15, oil lines.

$21.5 million contract authorization. NACA's construction allocation for fiscal 1949 was $28.2 million ($10 million cash and $18.2 million contract authorization), substantially more than Congress will make available for the next year.

Senate committee approved a total 1950 fiscal year budget for NACA of $63,710,000 ($53,710,000 cash and $10 million contract authorization approved).

This was $21,490,000 below Budget Bureau estimate of $85.2 million ($63.7 million cash and $21.5 million contract authorization) and $3,142,000 below NACA's current year budget of $66,852,000 ($48,652,000 cash and $18.2 million contract authorization). It was $5 million above the $58,710,000 ($48,710,000 cash and $10 million contract authorization) previously allowed by the House.

► **Personnel Rise**—The $43,610,000 approved by the Senate committee for NACA personnel and expenses is substantially above the $38,652,000 provided for the current year and the $38,710,000 which had been approved by the House.

Budget Bureau recommended $48.7 million.

Assuming the Senate backs its committee, the $5 million difference—$4.9 million for personnel and $100,000 for construction—between House and Senate allocations for NACA will be at stake in the joint conference between the houses.

► **Construction Details**—The $36.5 million construction program planned by NACA—which will have to be whittled down to the approximately $20 million which will be allowed by Congress—encompassed the following development projects:

• **Langley Laboratory.** 8-ft. transonic tunnel, $7,008,800; Wallops Island, $1,572,000; instrument laboratory addition, $1,105,000; gas dynamics laboratory, $1.5 million; internal flow laboratory, $500,000; flight research laboratory, $610,000; 10-ft. tunnel modification, $217,600; 16-ft. tunnel modifications, $551,000; 16-ft. transonic throat, $498,600; instrumentation laboratory, $150,000; pilotless aircraft laboratory addition, $350,000; additional utilities, $1.5 million.

• **Ames Laboratory.** 16-ft. tunnel modifications, $10,982,000; instrument research laboratory, $350,000; building annex, $350,000.

• **Lewis Laboratory.** Additional air-handling facilities, $3,905,000; propulsion-sciences laboratory, $2.9 million; instrument laboratory, $1,452,000; altitude-tunnel exhausters, $818,000; research-equipment building addition, $180,000.

Who Sells	What	How Much	To Whom
Adel Precision Prod. Corp., Burbank, Cal.	Heater pump parts & de-icing pumps	$1,124.21	Air France
Aeronautical Inst. & Radio Co., Little Ferry, N. J.	Spare parts	1,804.76	Air France
Aerovias Guest S. A., Miami, Fla.	Spare parts	36,534.55	Air France
Air Associates, Inc., Teterboro, N. J.	Communicator sets	1,160.00	Nederlansche Vliegtnigenfabrik, Amsterdam
Air Associates, Inc., Teterboro, N. J.	Spare parts	724.45	Air France
Air Union, Inc., Washington, D. C.	Spare parts	150.00	Escachille Mercure Taxis Aeriens, Paris
Airesearch Mfg. Co., Los Angeles, Calif.	Spare parts	1,834.85	Air France
Aviquipo, Inc., N. Y. C.	Spare parts	1,918.87	Air France
Bendix Int'l., N. Y. C.	Spare parts	32,390.97	Air France
Bendix Int'l., N. Y. C.	Instruments & parts	1,005.00	Dir. Technique et Industrielle, Paris
The Carburetor Corp., Mineola, N. Y.	Engines, parts	19,750.00	Air France
Curtiss-Wright Corp., Wood-Ridge, N. J.	Spare parts	28,324.54	Air France
Curtiss-Wright Corp., Wood-Ridge, N. J.	Spare parts	19,914.89	French Air Ministry
Douglas Aircraft Co., Santa Monica, Calif.	Spare parts	15,206.66	Air France
Durex Abrasives Corp., N. Y. C.	Spare parts	73.80	Air France
Esterline-Angus Co., Inc., Indianapolis, Ind.	Spare parts	384.90	Air France
B. F. Goodrich Co., Akron, Ohio	Aeronautical equip.	2,702.00	Air France
Kingsley Stamping Machine Co., Hollywood, Calif.	Spare parts	591.00	Air France
Kollsman Inst. Div. Square D Co., Elmhurst, N. Y.	Instruments	1,422.75	Air France
Lockheed Aircraft Corp., Burbank, Calif.	Spare parts	6,123.40	Air France
Newark Elec. Co., N. Y. C.	Spare parts	110.70	Comp. Nat'l. Air France, Orly, France
Newark Elec. Co., N. Y. C.	Spare parts	746.88	Air France
Norman Radio Dist., Inc., Jamaica, L. I., N. Y.	Radio & spare parts	508.53	Air France
Norman Radio Dist., Inc., Jamaica, L. I., N. Y.	Spare parts	725.92	Air France
Pacific Airmotive Corp., Linden, N. J.	Spare parts	1,662.50	Air France
Peerless Radio Dist., Jamaica, L. I., N. Y.	Spare parts	24.00	Air France
R. K. Price Assoc., Inc., N. Y.	Engine parts	2,469.25	Air France
Products Research Co., Los Angeles, Calif.	Fuel tank kits	1,373.75	Air France
Seaboard Aircraft Sup. Inc., N. Y. C.	Spare parts	111.65	Air France
South Bend Div., Stewart-Warner Corp.	Spare parts	4,505.02	Air Attache, Fr. Embassy
Sperry Gyroscope Co., L. I., N. Y.	Spare parts	326.25	Air France
Titeflex, Inc., Newark, N. J.	Spare parts	1,096.00	Air France
United Aircraft Export Corp., East Hartford, Conn.	Spare parts	8,694.00	Air France
United Aircraft Export Corp., East Hartford, Conn.	Spare parts	10,010.71	French Air Ministry
United Aircraft Export Corp., East Hartford, Conn.	Propeller parts	19,756.62	Dir. Technique et Industrielle, Paris
Vickers, Inc., N. Y. C.....	Engine parts	6,340.14	Air France
E. A. Wildermuth, Inc., Brooklyn, N. Y.	Element filters, aircraft & engine spare parts	8,387.05	Air France
TOTAL.....		$239,990.57	

Figures cover May 1–10, 1949

Aviation Business Under ECA

Economic Co-operation Administration (ECA) has allocated $239,990.57 in additional funds for foreign purchase of U. S. aircraft parts and acessories. This allocation brings ECA's aviation purchase authorizations to a total of over $49 million.

Latest ECA commodity suppliers' data list for the period May 1-10 shows that 30 U. S. firms supplied aviation equipment to Europeans buying through ECA. Air France was the greatest foreign buyer, accounting for more than $180,000 during the 10-day period.

No complete aircraft are included in the current listing. This is due to the fact that ECA has banned any further transport plane purchases by Marshall plane countries with ECA money. This restriction will remain in effect until the Marshall plan countries complete a study of their combined air transport systems detailing what they need and why.

Meanwhile ECA will continue to issue procurement authorizations for lightplanes and helicopters required for agricultural pest control, and for spare parts and accessories needed for maintenance on American built transports already operated by foreign airlines.

FINANCIAL

Aircraft Group vs. General Industry

Surveys of working capital, profitability and assets measure aviation against other manufacturing firms.

The position of the aircraft industry attains greater perspective when viewed in comparison with other industrial groups.

Interesting contrasts are afforded in a current study completed by the Securities and Exchange Commission on the working capital positions of 1275 corporations covering the period from Dec., 1939, to Dec., 1948.

This study shows net working capital of 21 aircraft and aircraft equipment companies increasing from $66 million at the 1939 year-end to $428 million at the end of 1948. Far greater significance in any comparative studies, however, can be seen in the changes developing during the postwar years. Here a much different story is revealed.

▶ **Against Trend**—This same number of aircraft companies showed a peak net working capital position of $598 million at the end of 1945. At the close of 1948, this amount fell to $428 million, a decline of more than 28 percent. By contrast, during this same period, the net working capital of 847 manufacturing companies in the SEC survey rose from $18,024 million to $22,198 million or a gain of more than 23 percent.

This shows that the overall working capital position of aircraft firms has shrunk considerably since 1945 and has not followed the same trend line of general industrial companies in the postwar period. Of all the separate industrial groups analyzed in the SEC study iron and steel were the only ones other than aircraft to have lost ground during the postwar period. And that decline was confined to less than 6 percent.

▶ **Variations Within Group**—The relative performance of the aircraft group in this respect is nothing more than a reflection of the extreme deflation of its activities from the scale of all-time peak volume operations prevailing during the war.

As with all averages, the experience has not been the same for all companies in the aircraft group. For example, North American Aviation shows a decline of only 5.4 percent in its net working capital from the 1945 to the 1948 year-ends.

Grumman's net working capital decreased from $23.8 million at the 1945 year-end to $20 million at the close of 1948, a decline of about 15 percent. An opposite extreme is found in the case history of Consolidated Vultee Aircraft Corp. which showed a net working capital of $56 million at the 1945 year-end. Three years later, these funds were down to $13.2 million a decline of some 77 percent.

▶ **Inventory Factor**—Net working capital determinations in the aircraft group are frequently misleading in their implied liquidity. By their very nature aircraft operations require considerable commitments in inventories and work-in-process. Such inventory accounts are not always realizable at the values carried in balance sheets.

For example, Glenn L. Martin Co. and Convair had for a time carried a large valuation in their work-in process inventories representing the development costs of new-type transports. Subsequent experience, however, revealed that these valuations were beyond recovery and were therefore charged to operating results with substantial losses realized in the process.

It is noteworthy that while there has been a general shrinkage in the net working capital positions of the aircraft builders, inventories have had a tendency to absorb a greater percentage in the composition of current assets during the postwar period.

▶ **Inventory Rise**—For instance, during 1945, inventories of the 21 aircraft units surveyed by the SEC study amounted to $367 million and comprised 21.4 percent of the industry's total current assets. The 1948 tabulation shows inventories at $335 million but this time representing more than 46 percent of the total current assets.

The more recent inventory ratio of the aircraft industry appears to be more in keeping with the general experience revealed by the survey of the 847 manufacturing companies compiled in the SEC survey. In this instance, inventories comprised 48 percent of total current assets at the 1948 year-end compared with but 34.5 percent as of the 1945 close.

▶ **Profit Study**—The relative profitability of the aircraft industry is outlined in another study prepared recently by the National City Bank of New York. This comprehensive survey which encompasses a total of 3262 leading American corporations reveals a series of interesting trends. A total of 25 aircraft and parts companies are reported to have shown net income, before taxes, of $17,571,000 for 1948 compared with a net loss of $35,280,000 for 1947.

The 1948 margin on sales averaged 1.4 percent. This same average for a total of 1680 manufacturing companies in the National City Bank compilation came to 7.5 percent. In other words, the aircraft industry's average profits for 1948 were far below the norm experienced by all manufacturing enterprises last year.

Of the forty-five separate industrial classifications shown in this study, only the meat packing group showed a lower margin of sales than the aircraft builders. At the other extreme, the cement industry showed the highest profit margin with 14 percent.

Another interesting ratio presented in the National City Bank survey is the percentage return on net assets. For 1948, these same group of aircraft companies averaged but 3.1 percent in this respect. A startling contrast is again afforded by the average 18.9 percent return on net assets realized by the entire 1680 manufacturing companies examined.

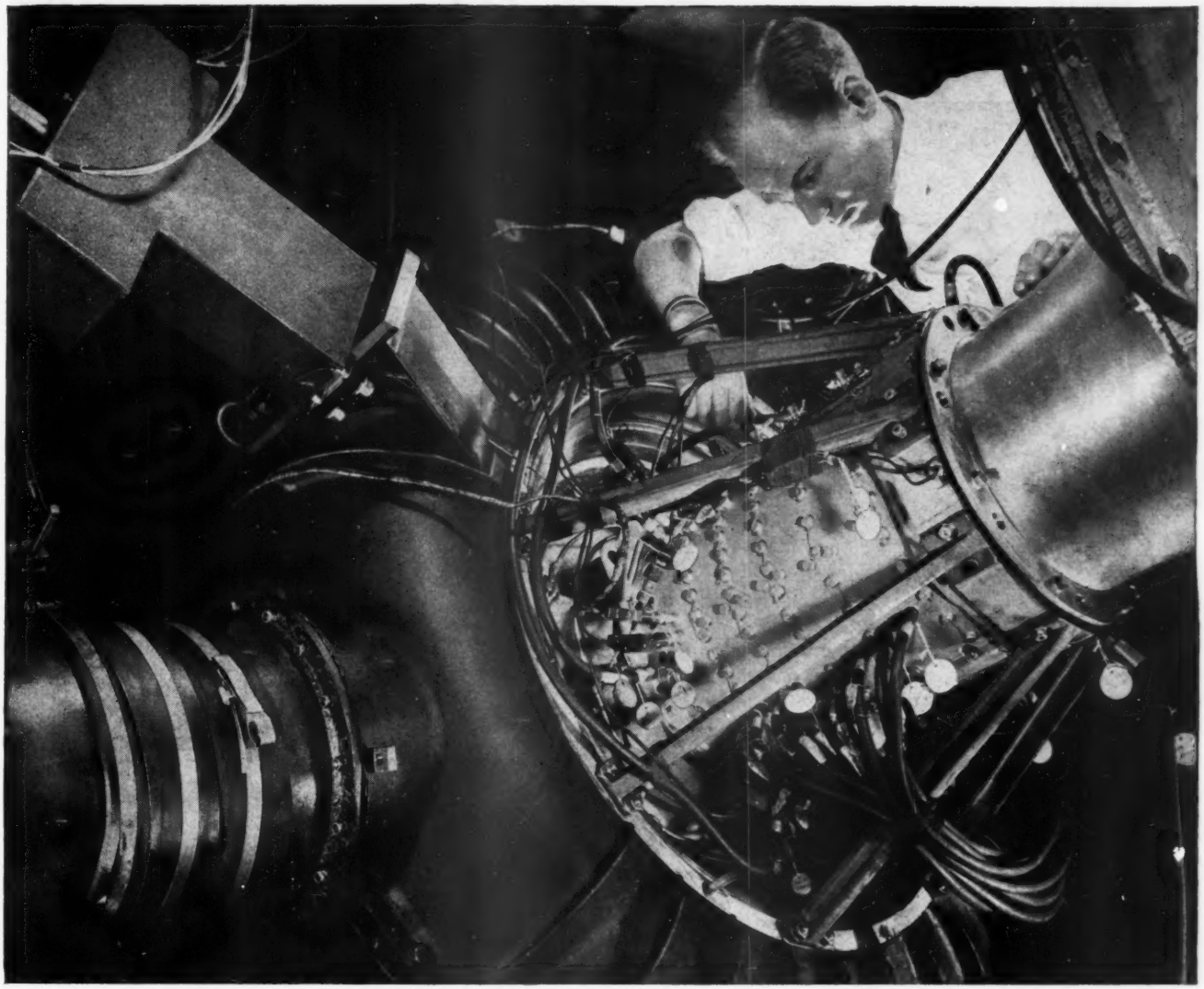
It is significant that the aircraft industry showed the lowest return on its net assets of any of the 45 industrial groups appraised. The negative return of 6 percent on net assets shown for 1947 by the aircraft group stands out as the only classification among all the industrials experiencing a loss during that year.

▶ **Assets Rating**—Still another study prepared by the National City Bank of New York reveals, by omission, the relative smallness of the largest aircraft enterprises. In this compilation, a list of the 25 largest American manufacturing corporations have been prepared at ten-year intervals starting with 1900.

The tabulation as of the start of 1949, shows the largest corporation, Standard Oil of N. J. as having $3.53 billion of total assets. The twenty-fifth company on the list is the Chrysler Corp. with total assets of $541 million. The aircraft company showing the largest amount in net assets at the 1948 year-end is Curtiss-Wright Corp. with $155,614,000. This reveals the relative location in the scale of large American corporate enterprises of aircraft companies when evaluated by size.

Sheer magnitude of assets, however, are not controlling factors in the outlook of any industry or company. The basic measure remains profitability and by this test the aircraft industry's average is currently running far behind that of all general manufacturing enterprises.

—Selig Altschul



GIVING AIR THE NEEDLE

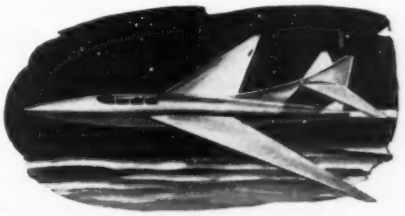
▸ This research engineer is literally "probing" the inside of an Axial Flow Compressor...for data that will enable Wright Aeronautical to design better compressor blades *today* for *tomorrow's* jet engines.

▸ Bristling porcupine fashion from the compressor on test are the sensitive probes. Inside each probe are four tiny hypodermic needles that measure the velocity, pitch and yaw angles of the air flow. These various measurements are taken *axially* along the length of the compressor, *radially* from the bases to the tips of the blades and *circumferentially* around the casing.

▸ From this data the Wright engineer determines the angle of attack, correct twist and airfoil contour of the blades in each stage of compression. Result? Improvement in compressor design to provide a considerable increase in the over-all efficiency and power output of new engines.

▸ Just as this research points toward better compressors, so the actual research technique involved results in greater laboratory efficiency. Many man hours and dollars are saved and far more accurate data is obtained.

▸ This investigation of every slight detail of compressor blade performance is typical of the aerodynamical research at Wright Aeronautical to produce better power plants for better aircraft today and in the future.



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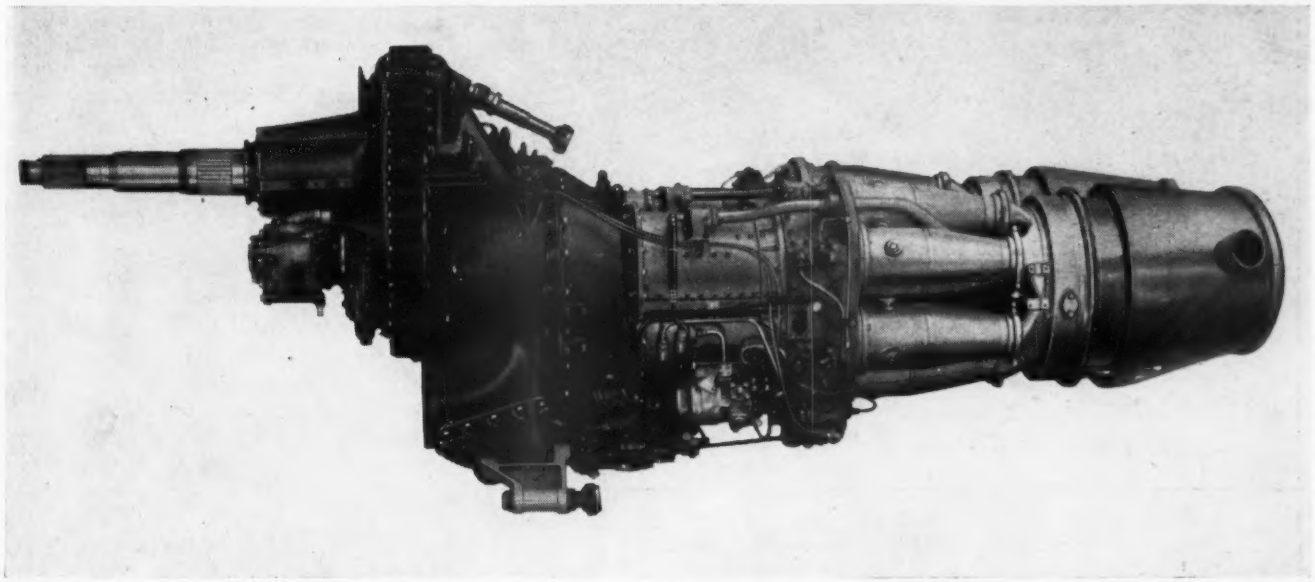


DOUBLE MAMBA makes possible compact powerplant installation despite size of reduction gear, because of side-by-side arrangement.

Double Turboprop Engine Built in Britain

Armstrong Siddeley gears two Mambas to coaxial contrarotating propellers to develop peak of 3500 hp.

British engineers' confidence in the gas turbine-propeller has been strikingly demonstrated by disclosure of a multiple engine.

Armstrong Siddeley Motors Ltd.'s new double Mamba, basically two Mamba IIs placed side-by-side, is now under consideration for installation in two secret planes. It was exhibited at the recent Paris Air Show.

Details of this engine, probably the first that have been disclosed on multiple turbine-propeller units, show British progress with this type of powerplant.

► **Separate Operation**—Although the engines are joined together at the front and use the same air intake and propeller shaft reduction gear casings, they are two separate power units, with their own fuel, lubrication and control systems.

Each engine has its own reduction gear and drives one of two opposite rotating coaxial propellers.

Combination of the two Mambas, with their axial flow compressors, affords a compact power group. It is reported to permit high economy in fuel consumption when cruising at low power, with a high power to weight ratio for maximum power operation.

Either engine may be shut down and restarted independently, deemed a considerable advantage when maximum range or endurance is required. Each delivers 1270 shp. and about 400 lb. jet thrust.

► **New Reduction Gear**—Reduction of speed required is from 15,000 rpm. at the compressor shaft down to a propeller shaft speed of 1450 rpm.

Port engine drives the front propeller, starboard engine the rear propeller. Both reduction gears are separate although the counter-rotating props are mounted coaxially.

On both port and starboard engines the reduction is via a compound epicyclic gear train. A helical sun gear on the compressor shaft engages with three helical planet gears. Mounted on the same axis as the three helical planet gears are three spur planet gears meshing with a floating internal gear (63 teeth). Attached to the planet gears is a carrier revolving with them as they rotate within the annulus gear.

Mounted on the front of the carrier is a spur gear. On the port engine, this drives the gear on the propeller shaft through an idler gear. On the starboard engine, it drives the propeller shaft through two idler gears. The extra idler on the starboard drive rotates the rear propeller in an opposite direction to that of the front prop. In other respects both drives are identical.

► **Oil Pressure for Balance**—The floating internal gear is prevented from rotating by engaging with three bellcrank levers connected to three pistons.

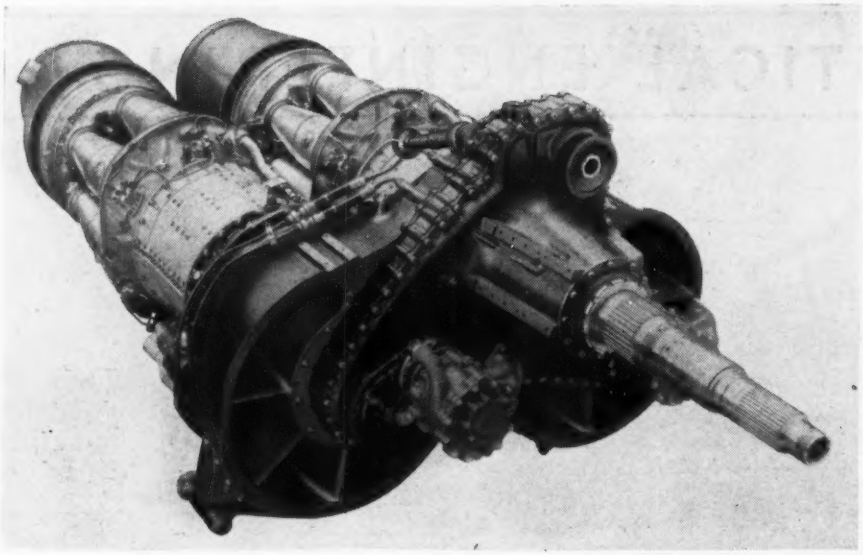
Tendency for the internal gear to move radially due to torque reaction is balanced by oil pressure on the forward side of each piston. These pistons perform the function of a torquemeter. Pressure in the torquemeter system is read on a gage in the cockpit. Engine bhp. = pressure (psi.) × rpm./3778.

The torquemeter pistons are steel with cast iron sealing rings, cylinders have steel sleeves in magnesium alloy bores.

► **Bearing Details**—The three spur planet gears are supported by roller bearings. A ball thrust bearing is provided at the rear end of each planet gear shaft to take the thrust of the helical planet gears. An adjusting washer is also provided to control the backlash of the helical gear assembly.

Each idler gear is supported on either side by a roller bearing. The outer, or front propeller shaft is supported at the front by a roller and ball bearing (outer races are in the front cover) and at the rear by a roller bearing (outer race fits in the front cover diaphragm).

Inner or rear propeller shaft, passing through the hollow outer propeller shaft, is supported at the front by a roller bearing whose outer race fits in the prop hub. At the rear it is supported by a roller bearing and a ball bearing, with outer races fitting in the air intake casing. Propeller thrust is



COMMON INLET and gear casing serve both units in the double Mamba.

Double Mamba–Basic Data

General

Maximum width	52.8 in.
Maximum height	42.35 in.
Overall length (rear face of propeller fitting cone to rear face of turbine housing)	79.83 in.
Net dry weight	2000 lb.
Air mass flow, sea level static, for each engine	17.6 lb./sec.
Fuel	Aviation kerosene

Performance — Sea Level

Rating	Rpm.	Aircraft speed, mph.	Propeller Shp.	Net Jet Thrust	Fuel Cons. Gal./hr.
Maximum takeoff	15,000	0	2540	770	258
Maximum climb	14,500	150	2287	490	235
		200	2360	428	238
		250	2475	370	243
Maximum continuous cruise	14,000	250	2175	310	220
		300	2300	255	225
		350	2475	200	232
Maximum combat	15,000	350	3250	325	290
		400	3500	280	300

taken by the ball bearing on both prop shafts.

► **Engine Auxiliaries** – These are mounted parallel to the centerline of the engine to the front and rear of the auxiliaries case, which is immediately aft of the air intake and engine mounting casting.

The drive is transmitted from the propeller shaft reduction gear through a single inclined bevel shaft passing through one of the streamlined struts in the annular air intake, to a train of spur gears housed in the auxiliaries case.

Auxiliaries include: governor-operated ignition switch, oil scavenge pump, electric tachometer, propeller constant speed unit, fuel pump and engine overspeed governor, and main oil pressure and oil micro metering pumps. Oil pressure filter and relief valve is mounted on the end of the auxiliaries case.

The same single lever control system is used as on the single Mamba. There is a throttle lever in the cockpit for each engine. A fuel isolator control lever is provided for stopping each engine.

► **Aircraft Accessories Gearbox** – This contains those accessories essential for the operation of aircraft installations such as wheelbrakes, flaps, landing gear, lighting, etc., but which are not essential for the running of the engine. Accessories consist of two generators, vacuum and hydraulic pumps, and a compressor.

The accessories gearbox is mounted above the air intake casing. It is driven by a shaft mounted in ball and roller bearings housed in the front cover and reduction gear casing above the propeller shafts.

This shaft is driven by both propeller shafts. Gear on front propeller shaft meshes directly with a driving gear on the accessory box drive shaft. Gear on the rear propeller shaft drives a second gear on the accessory drive shaft through an idler to obtain the correct direction of rotation.

Thus, the remote accessory gearbox is therefore driven by both port and starboard engines.

To avoid a connected drive between the two engines, a free wheel assembly is built into the two gear wheels on the accessory drive shaft.

The accessories drive can transmit up to 100 hp. at maximum rpm. and is so arranged that full power is available when either engine is feathered.

► **Lubrication System**–On both engines a main pressure type oil pump supplies oil at 70 psi. to the propeller constant speed unit, prop reduction gear bearings, oil jets for the reduction and accessory gears, metering pump, high pressure oil pump, and front main and center compressor bearings.

The metering pump feeds the rear main turbine bearing with ½ pt. of oil per hr. This runs to waste. Quantity of oil fed to the front main bearing is controlled by restrictor grooves.

The high pressure gear-type oil pump, which receives oil at 70 psi. from the main pressure pump, supplies oil only to the torquemeter cylinders.

All scavenge oil drains into a sump and filter at the bottom of the engine. It is drawn off by the scavenge pump and directed through an oil cooler back to the tank.

The oil consumption is less than 2 pt./hr. for each engine at the maximum continuous rating of the engine–14,000 rpm. Maximum oil inlet temperature is 90 C., and the normal temperature is 70 C.

► **Gear Oiling System**–Lubrication of the propeller reduction gear on each engine is separate, and circulating oil is divided by a wall in the reduction gear housing. Thus, one engine can be removed from the airframe without disturbing the lubrication system of the other.

If one oil tank is utilized for the two oil systems, it is considered necessary to have a central wall in the tank to insure that the two systems are completely independent, and each engine must have its own oil cooler.

Independent starting for each engine is provided by a turbo-starter motor mounted on the propeller reduction gear housing. Engines also may be started simultaneously.

Immediately above each starter motor is a breech containing 2 or 3 cordite cartridges.

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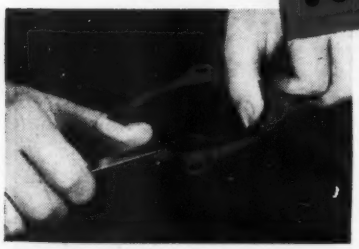

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Slotted Parachute Gives Better Control

MATS Air Rescue Service emergency medical rescue parachute teams are using a new Derry-slot parachute, which gives the jumper far greater control over his landing spot than has previously been available. By the use of guide lines, the jumper can open and close slots that can give him a forward or rearward "cruising speed" up to 5 mph.

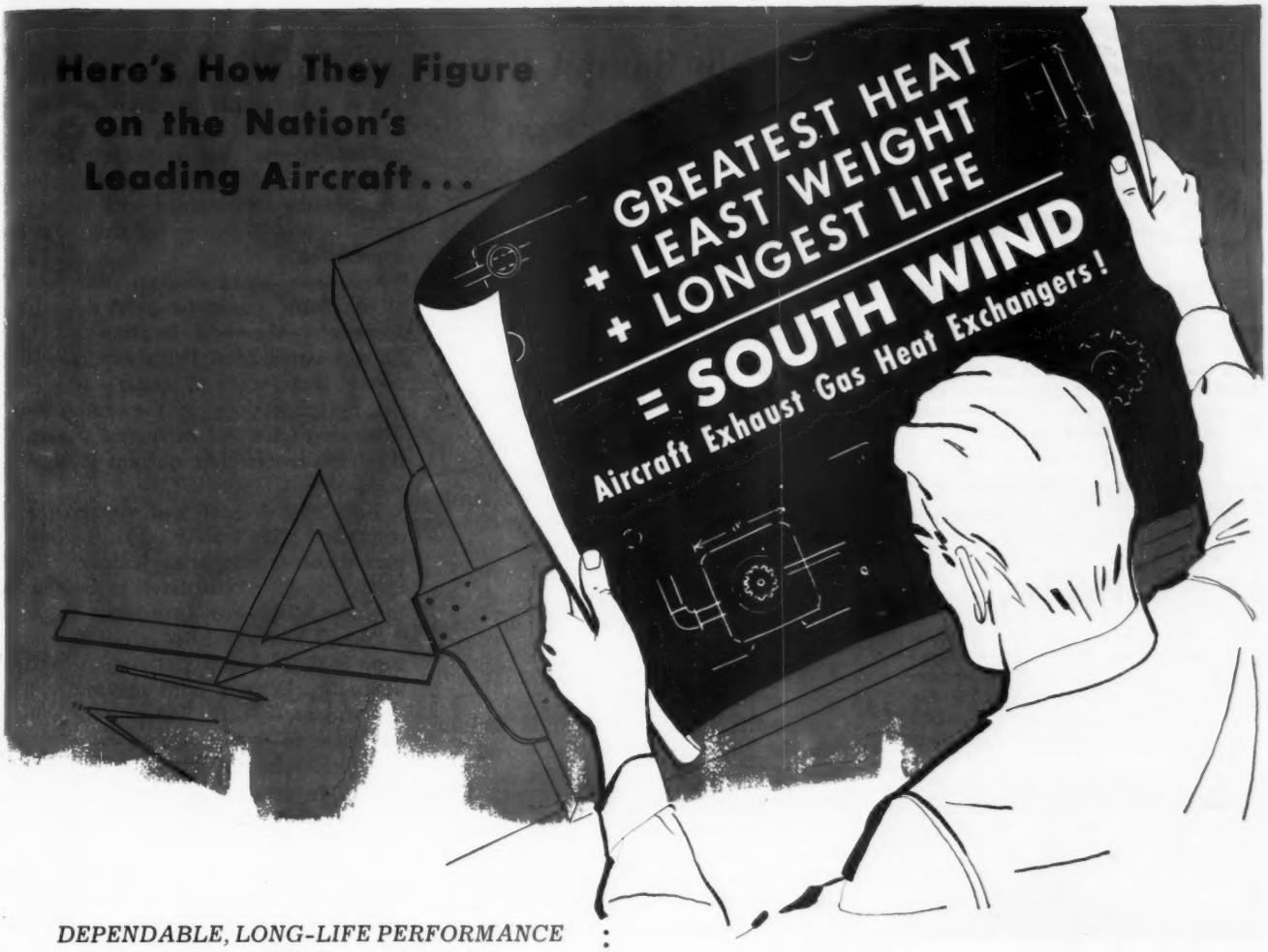
The slots, located in the front and rear of the chute extending from the apex to the apron, are made by omitting a panel which forms "V" shaped cut-out. A guide line extends from both apron edges of the slots to the jumper.

By pulling on one pair of lines, the jumper closes a slot. When the lines to the opposite slot are relaxed the slot is opened, causing air to spill, creating a reaction in other direction.

▶ **Out of the Woods**—The new parachute was invented by Frank M. Derry, a "smoke jumper" with the U. S. Forest Service. Derry formerly was a rigger and jump instructor with the Eagle Parachute Co. and began work on his slot idea while serving as a parachute instructor and rigger with the Forest Service from 1940 to 1946.

Air Rescue Service "pararescue teams" are trained in specific rescue and survival tactics to provide first aid to survivors of aircraft crashes. The team members are tutored in snow and water jumps in addition to techniques for jumping into wooded areas. An old problem has been solved by the addition of a 75-ft. nylon rope to the chutists equipment to permit "rope let-downs" from high trees. The rope is visible as a bulge on the right leg of the chutist shown.

Here's How They Figure on the Nation's Leading Aircraft...



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Eliminates severe thermal stress!

Provides internal flexibility!

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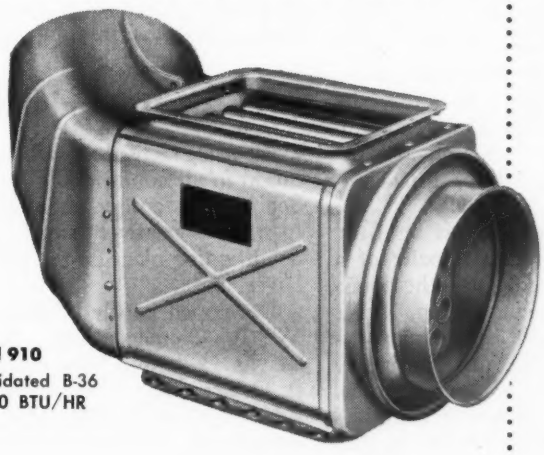

Model 910
Consolidated B-36
230,000 BTU/HR

From 160,000 to 800,000 BTU/HR, South Wind exhaust-gas to air-heat exchangers have set unequalled standards of performance, dependability and safety in the nation's leading aircraft.

Especially Suited for Thermal Anti-Icing of wing and tail surfaces, these extremely lightweight units are of all-welded, stainless steel construction. Compact and rugged South Wind exchangers often *outlive* the exhaust systems to which they are connected.

Adaptable to any type of commercial, military or civilian aircraft, South Wind exhaust gas heat exchangers combine maximum heat output with minimum weight. Write today for specific model information or expert assistance on your aircraft heating problem. South Wind Division, Stewart-Warner Corporation, Indianapolis 7, Indiana.

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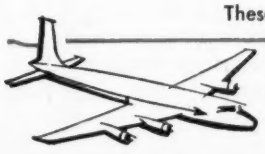
These outstanding aircraft testify to South Wind Leadership in the exhaust-gas heat exchanger field...



Model 900	Model 918	Model 923	Model 912	Model 928	Model EX-68141	Model 915-A
Consolidated B-24	Fairchild C-82	Northrop F-15	Consolidated PB4Y2	Northrop B-35	Curtis-Wright P-87	Consolidated B-32
200,000 BTU/HR	345,000 BTU/HR	380,000 BTU/HR	160,000 BTU/HR	800,000 BTU/HR	450,000 BTU/HR	390,000 BTU/HR

Two new 4-place seaplanes equipped with Edo all-metal floats are currently going through flight tests for certification. Their attractive performance figures and price tags ought to make them ideal for profitable commercial operations and should provide greater utility for private seaplane owners.

One of these is the new all-metal 4-place Cessna 170 (shown above) with a Continental 145 horsepower engine. The other is the 115 horsepower Piper Clipper (below) which will sell as a seaplane for less than $5,000.

One of the most interesting projects completed recently at the Edo plant was the design and construction for the Army Transportation Corps Board of a 32 foot Shallow Draft Cargo Launch. It is built in three sections, bow, stern and center, for easier handling and can be carried in a C-82 cargo plane.

The launch is intended primarily for transporting men and supplies in Arctic waters. Weighing only 3000 pounds empty, it carries 5000 pounds of cargo yet draws only 24 inches of water Its 60 horsepower engine can be pre-heated for starting in extreme Arctic cold by a gasoline-type heater installed in the engine compartment

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- SEAPLANE FLOATS
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Color Television Tried in Ramjet Run

Feasibility of adapting color television for observation of combustion phenomena in ramjet testing is being explored by Wright Aeronautical Corp. in connection with an engine development contract with the Air Materiel Command.

A demonstration recently conducted at the company's Wood-Ridge, N. J., laboratories was probably the first occasion that color television has been applied to see this type of supersonic engine in action.

▶ **Color Vital**—Because flame color is an important indication in combustion research and engine performance, color television offers interesting potential as a substitute for close-up viewing by engineering personnel. It would serve to eliminate the considerable hazards attendant with the operation of the ramjet test rig.

- Temperatures encountered range upward of 3000 F.
- Pressures in the combustion section may be 20 times that of the outside.
- Heat, vibration and noise are intense.
- And general danger to operating personnel increases with increase in size of the ramjet unit.

▶ **Research Phases**—Wright Aero's immediate study is being conducted on a 6-in. o.d. combustion section. A steam ejector aft of the jet creates suction to simulate altitude conditions.

Phases under investigation include effect of mixture variation, evenness of flame distribution, and blowout—a characteristic tendency of the ramjet, resulting from the high speed of the air through the combustion chamber.

Color television could offer important aid in research on these operational factors.

▶ **Previous Application**—At the recent Wood-Ridge demonstration, the television aspect of the test was under the direction of Dr. Peter Goldmark, director of engineering research and development at the Columbia Broadcasting System.

This company designed and built the equipment, consisting principally of a camera, monitor console, and the equivalent of a 12-in. viewing screen. It was loaned for the Wright Aero demonstrationn by the owners, Smith, Kline & French Laboratories, pharmaceutical manufacturers, who recently exhibited the use of color television in surgery and medicine at a meeting of the American Medical Assn., in Atlantic City, N. J.

▶ **Observation Details**—The camera was set up in the control room and through the observation window scanned the ramjet exhaust at about 20 ft. distance. Pictures were seen on two screens in an adjoining room.

General effect of the reception was good, but it seemed that sharper definition of colors in the exhaust flame would be desirable. Considering that the demonstration was an unprepared "dry run," more effective reception would undoubtedly be obtained with more experience and planning for this type of application.

▶ **Windows**—Since closeup observation of the flame would be most desirable, apparently the best location for the camera would be at Pyrex windows (for cooler sections) and quartz windows (for hotter sections) in the ramjet unit. Thus, with the aid of several cameras, the various chamber stations could be scanned.

But intense heat and vibration encountered with testing of large ramjets presumably would bring technical difficulties which would have to be licked to permit this close proximity.

▶ **Prior TV Uses**—This is not the first time that television has been used industrially. Wright Aero previously has experimented with black and white television in ramjet testing.

And Remington Rand Inc.'s Vericon television system, also black and white, has been used in engine testing and in Army Ordnance activities.

In the latter work, a remote controlled mechanism safely permits engineers to defuse, debooster or disassemble hazardous high-explosive-filled bombs or projectiles from behind a protective barricade, while the operation is kept under constant surveillance via a television viewing screen.

Seven ammunition disassembly plants already use Vericon portable television, with other plants scheduled to follow shortly.

Both the CBS and the Vericon devices use a coaxial cable instead of transmitting impulses through the air.

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By using activated carbon air purification in air conditioning system of the Boeing Stratocruiser, engineers were able to make a relatively small compact air conditioning plant do the job of a much larger one.

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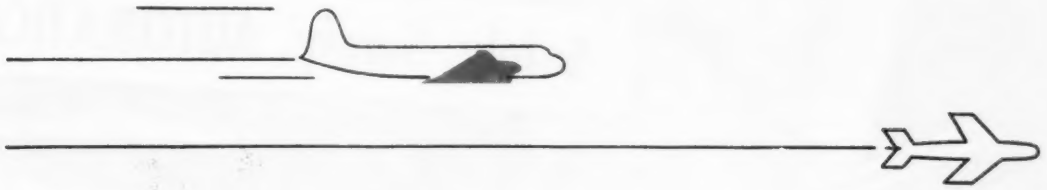

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Hydraulic Fluids

Results of widespread tests give valuable data but no definite answer.

Service testing of a variety of nonflammable hydraulic fluids for aircraft (AVIATION WEEK, Nov. 15, 1948) has accumulated valuable data, but none of them change the situation that existed six months ago: no suitable fluid is available.

Results now are at hand on tests conducted by the Civil Aeronautics Administration. TWA, Boeing and United Air Lines over the past few months. These still indicate that available fluids are either nonflammable or suitable hydraulic fluids—but not both.

▶ **Hydrolube U-4**—The fluid developed by the Navy and which has its approval for use on their aircraft is Hydrolube U-4. While results of Navy service tests are unavailable, TWA has been testing this fluid in the cabin supercharger system of a Constellation.

This is a separate, self-contained system and approximately 825 hrs. have been accumulated. TWA reports excessive wear on pump and motor parts due to the lack of adequate lubricity of the fluid at high operating pressures. Another difficulty is the susceptibility of the fluid to aeration, resulting in erosion of operating parts due to cavitation. This tendency of U-4 to entrain air is many times worse than standard AN-VV-O-366 fluid.

▶ **CAA Tests**—The CAA has tested this fluid in both a Douglas DC-3 and DC-4. Tests on the latter airplane have been discontinued because of excessive corrosion in magnesium fittings and valves in both the aircraft and brake hydraulic systems. Its use in the DC-3 is continuing but results in this airplane show same indications as in the DC-4.

Boeing Airplane Co. recently tested U-4 in a mockup of the Boeing 377 Stratocruiser hydraulic system and accumulated some 200 hr. of service time at various temperatures. Near the end of this period a cooler was changed in the system and some 20 hr. later the entire system broke down due to accumulations of sludge.

Boeing engineers traced the difficulty to the fact that the cooler had been cleaned with carbon tetrachloride prior to installation and this material completely upset the chemical balance of the U-4 fluid upon contact.

▶ **Skydrol**—United Air Lines has been testing this product of Monsanto Chemical Co., Skydrol in the cabin supercharging system of a Douglas DC-6 and has accumulated approximately 600 hr. of flight time. The system is still operating satisfactorily and until it is disassembled the exact extent of lubricity of this fluid cannot be determined.

However, United reports that spilled or leaked fluid has removed paint. It also has a deleterious effect on electrical wiring which has been soaked in the fluid. Although other tests indicate that nylon wiring is not as susceptible to the fluid, no means have been found for protecting existing wiring.

▶ **StanCal Type A**—A new fluid StanCal Type A, has been tested by TWA in a supercharger run-in test stand and about 600 hr. has been accumulated. Although this fluid has held up satisfactorily to date, TWA points out that the test installation uses special fluid seals and that use of this fluid in current aircraft, like U-4, would require complete replacement of hydraulic seals.

Other airlines, notably Trans-Canada Air Lines and Pan American Airways are service testing one or more of these three fluids in closed systems in flight tests and in ground laboratories.

However, service tests on these fluids over the past few months have not changed the earlier indications that current nonflammable hydraulic fluids, while exhibiting desired nonflammable characteristics, create corrosion, lubricity, cavitation and deterioration hazards that perhaps only an entirely new chemical approach to the problem can solve.

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B-36: Fortissimo or Fiasco?

A British aeronautical engineer takes a critical look at the biggest piston-engine bomber in the world.

One must commend the editor of an American aviation magazine for his courage in ventilating the current and future status of the Convair B-36 long-range strategic bomber. Having persistently criticized this piston-engined Goliath right from its public debut, the writer is glad to have the privilege of placing his cards face up on the table in stating the case against it.

No doubt this will inspire some of our American friends to rise in its defense. At the outset, however, we will disarm any counter criticism of current British bombers by cheerfully admitting they should be relegated to museums—or sold for hatracks!

▶ **Publicity Puffs**—First, one must get the performance facts cleared from behind the publicity puffs which have been blown around the B-36. It began with the prototype XB-36 at a design gross weight of 278,000 lb. and the bombastic claim of a range of 10,000 miles carrying a 10,000 lb. bomb load on a fuel tankage of approximately 21,000 U. S. gallons.

Assuming that this fuel and bomb load could be substantiated on a gross weight of 278,000 lb. (a very doubtful premise in view of subsequent overload figures), the maximum range was in the 8000-8500-mile bracket—which meant an operational target radius of about 3000 miles.

At this stage of development, however, the deficit was not of paramount importance, although it hardly squared with the widely publicized claim that: "The B-36 could carry an atomic bomb to any inhabited region of the world and return home without refueling."

This assumes the unproven hypothesis that the B-36 would be permitted to vault the Iron Curtain, front and back, without having to fight a determined offensive force equipped with high-altitude jet fighters. That sort of brag must make the Russians smile in their beards . . .

▶ **Target Speed and Ceiling**—We next hear of the first production batch, the B-36A, with a gross weight between 300,000 and 310,000 lb., powered, like the prototype, with Wasp Major R-4360-25 engine. This engine is rated at 3000 hp. for take-off and is claimed in some quarters to maintain its normal continuous rating of 2500 hp. up to a critical supercharger height of 40,000 ft. Our own information indicates a more modest altitude rating for this particular model.

Based on an exhaust back pressure limitation of 31-in. Hg., our data show a maximum power of 2400 hp. at 25,000 ft., falling off to approximately 2000 hp. at 40,000 ft. On the latter assumption, the service ceiling at the target could be as high as 42,000 ft. and the top speed about 345 mph. at 35,000 ft.

The second production aircraft, the B-36B, has the gross weight increased to 326,000 lb. and is powered with the later R-4360-41 engine, wet-boosted to 3500 hp. for take-off and a normal altitude rating of 2650 hp.

Again, there is considerable "cloudiness" concerning the power vs. altitude characteristics of the engine, a continuous rating of 2650 hp. being claimed up to 35,000 ft. Compared with the earlier Model –25 engine this is an altitude drop of 5000 ft. for a very small power gain. We suggest that it hardly makes sense or progress and hence should be treated with reserve.

▶ **"Case A"**—However, on this basis—which we will denote as "Case (A)"—the service ceiling at the target works out to 39,000 ft. and the maximum speed to 370 mph. at 35,000 ft. The optimum range cruising speed at this height is 295 mph. and this should also be roughly the overall average cruising speed for a long-range mission. To date, most of the B-36 long-range flights have averaged around 230 mph., which seems to indicate considerable room for improvement in the cruise control technique.

The accompanying table shows all the aerodynamic cards face-up. No attempt has been made to evaluate such secondary factors as engine cooling power loss, possible exhaust thrust augmentation, or intake ram effect on altitude, since to a first approximation, they nullify one another.

Note that all altitude performance figures for the B-36B are computed on a gross weight of 216,000 lb. at the target, just before the bombs are released. This target weight assumes a half-way range point of roughly 5000 miles, after some 60 percent of the fuel and oil has been consumed.

▶ **"Case B"**—Probably nearer the truth, however, is "Case (B)", since it follows a more logical trend in power step-up from the earlier Model –25 engine used in the B-36A. It assumes that the power of the Model –41 engine in the B-36B has been increased by raising the exhaust back pressure limit of 31-in. Hg. to 34-in. There is, in fact, a basis for this reasoning in the case of the Republic XP-12, which has a somewhat similar Wasp Major installation designed to operate at 40,000 ft. On this analogy, the maximum power at altitude is approximately 2600 hp. at 25,000 ft. dropping off 2150 hp. at 40,000 ft.

Power assumption (B) results in lowering the maximum speed to 350 mph. at 35,000 ft. and lifting the service ceiling approximately 41,000 ft.—thus, incidentally, establishing Convair's claim that the B-36B does have a service ceiling over 40,000 ft. Cases (A) and (B) are compared in the accompanying graph, which shows the maximum (not the cruising) speed performance at the target. The curve for Case (B) checks well with most bombing tests so far published.

▶ **Range Performance**—What about the range performance of the B-36B—how was the latest figure of 9600 miles, with a 10,000-lb. bomb load over 5000 miles ob-

Aerodynamic Data—Convair B-36B

	Characteristic	Symbol	Value
Airframe	Takeoff Gross Weight	W_1	326,000 lb.
	Target Gross Weight (Bombs On)	W_2	216,000 lb.
	Target Gross Weight (Bombs Off)	W_3	206,000 lb.
	Landing Gross Weight	W_4	136,000 lb.
	Wing Area	S	4772 sq. ft.
	Wing Span	b	230 ft.
	Aerodynamic Efficiency Factor	e	0.77
	Geometric Aspect Ratio	$A = b^2/S$	11.1
	Effective Aspect Ratio	$A_e = e\,A$	8.55
	Parasite Drag Coefficient (min.)	C_{d_o}	0.016
	Parasite Drag Area	$f = C_{d_o} S$	76.4 sq. ft.
	Aircraft Lift/Drag Ratio (max.)	L/D	20.5
Powerplant	Propeller Diameter (3 blades)	D_3	19.0 ft.
	Propeller Rotational Speed (G. R. = 0.38)	n	16.2 rps.
	Propulsive Efficiency ($V_{max.}$)	η_m	0.73–0.77
	Propulsive Efficiency ($V_{cruis.}$)	η_c	0.84
	Specific Fuel + Oil Consumption (aver.)	c	0.50 lb./bhp./hr.

Normal Power vs. Altitude (N = 2550 rpm.)	Case (A) bhp. / ft.	Case (B) bhp. / ft.
	2650/25,000	2600/25,000
	2650/30,000	2500/30,000
	2650/35,000	2340/35,000
	2000/40,000	2150/40,000

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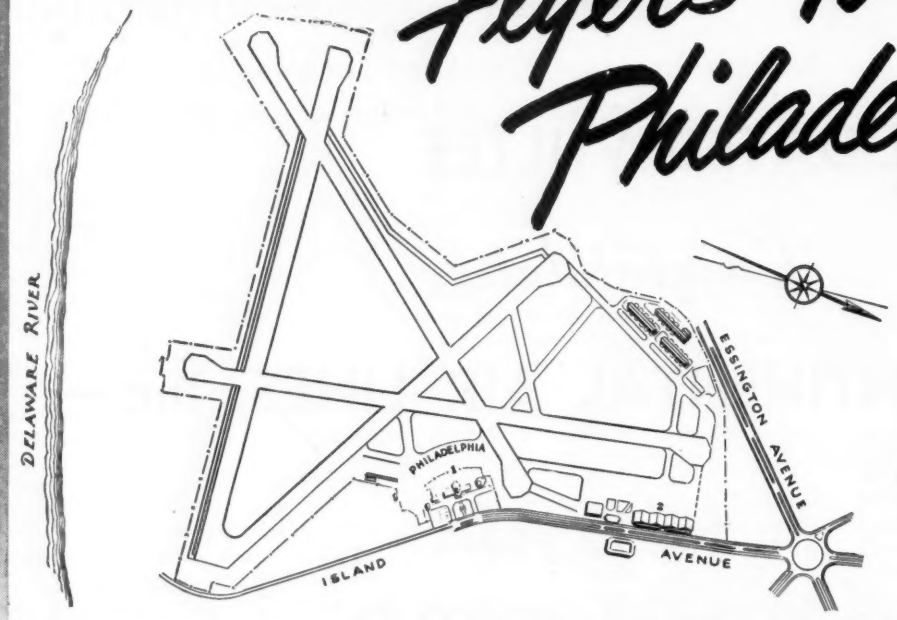

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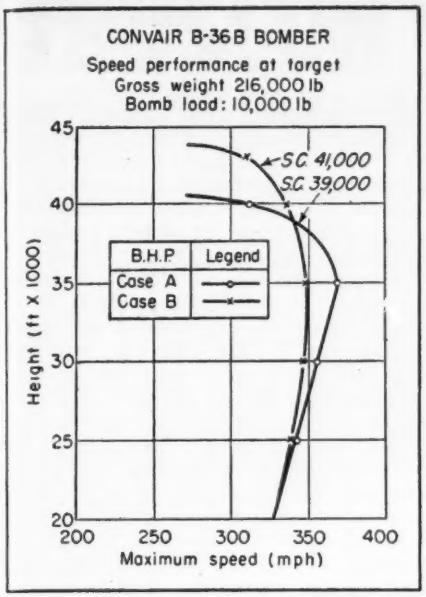

tained? The writer's guestimate is that this mileage was obtained with a fuel tankage of approximately 27,000 U. S. gallons by utilizing extra tanks in the bomb bay to the extent of 6000 gallons.

Under the most favorable conditions (average specific fuel-plus-oil consumption of 0.50 lb./bhp/hr. and propulsive efficiency of 0.84), our slide-rule turns up a maximum possible range of 10,600 miles, so there need be no quibbling on that score. The B-36B will undoubtedly exceed its original specification range of 10,000 miles by a comfortable margin, granted a large part of the bomb bay is used in this manner.

▶ **No Trapeze Act**—Such a large (and inflammable) nigger in the bomb bay seems to rule out the man on the flying trapeze—which is perhaps a good thing, for it is difficult to believe that this idea was ever taken seriously.

Our guess is that USAF will quietly shelve the McDonnell XF-85 parasite fighter project—without too much publicity this time in reversing itself. Announcement of the jet boosted B-36D model shows the straw in the wind—speed boost at the target, rather than fighter protection.

▶ **Fighter versus Bomber**—If our speed-altitude analysis is of the right order, the B-36B will approach its long-range target at a cruising speed of 290-300 mph. at 35,000 ft. Pulling out all the power stops, this figure can be upped to 350-360 mph. in case of combat emergency, which still makes it practically a sitting duck for a squadron of interceptor jets, such as a Russian equivalent of the lightly loaded DH Vampire.

Should the B-36B prefer to wallow up to 40,000 ft. (just under its target ceiling limit), its top speed will drop off to 335 mph. and its maneuverability become frozen static almost, since no aircraft has any maneuverability worth talking about at its service ceiling. Actually, a service ceiling is an "escape"—not a "combat" ceiling.

▶ **Speed or Altitude?**—It may be true at the moment in America that the affirmative for the piston-engined bomber has been temporarily strengthened by the altitude shortcomings of American jet fighters—at any rate, those now operational in the USAF. The latter defect, we believe, has been con-

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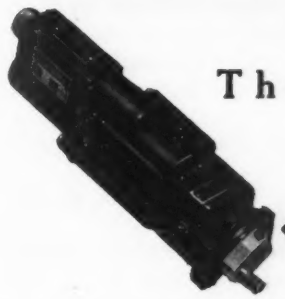

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firmed by RAF pilots who have flown them. One suspects that the American passion for chasing the speed ribbon—partly due, perhaps, to inter-service rivalry is not paying off so well as the British altitude ribbon.

The de Havilland Ghost-Vampire, holder of international height record, has done a lot of development flying since 1947 between 50,000 and 60,000 ft., and British generally design jet fighters primarily for rapid interception and stratospheric mobility.

It is unlikely, therefore, that an interceptor jet which can hit 40,000 ft. in 8 minutes and 50,000 ft. in less than 14 minutes will be outmatched or outgunned by a piston-engined bomber which was born on the drawing board some five years earlier.

Neither does this writer believe that the piston-cum-jet B-36D offers any serious prospect of salvaging the vast amount of time, money and manpower that has already gone into this World War-II project, for the concept smacks of a patchwork solution. It is true that the takeoff run will be shortened and the initial climb nearly doubled, but the stratospheric top speed for combat emergency at the target is likely to be Mach-limited to around 460 mph. (M = 0.70), a figure which is still out of court against the jet interceptor—bearing in mind the design status of the latter by the time the B-36D is fit for operation service.

► **Jet Bomber Design**—There is something spurious in the idea of mounting a row of jet barnacles to an existent piston-engined design, in order to boost it off the ground and to give it the extra kick to cover its inherent slothfulness. We do not think it can ever pay to take four parasite barrels for a ride—especially such a long ride sitting outside in the breeze.

The logical answer is surely an all-jet bomber designed *ab initio* to accommodate the requisite long-range tankage—which, incidentally, would be considerably less than that now carried in the B-36B. (It must be still larger in the B-36D in order to take care of the higher gross weight—now reported at 358,000 lb.—and the extra consumption of the jets, plus the drag penalty of the barnacles.)

The Boeing XB-47 Stratojet, for instance, although stated to have a nominal design gross weight of 125,000 lb., appears potentially capable of holding some 14,000 U. S. gallons of fuel in its long canister-type fuselage, which seems to presage an eventual overload gross weight of at least 180,000 lb. with a 10,000-lb. bomb load.

At this weight, a B-47B version powered with six J-47 5000-lb. turbojets could have (theoretically, at any rate) a maximum range of 8000 miles, if the jets are cruised at 75 percent of their normal thrust. The cruising speed, incidentally, would be about 570 mph. (more than double that of the B-36 as flown), while at the target weight of 122,000 lb., the service ceiling comes out at 48,000 ft.

► **Jet Wing**—Northrop, too, now has enough technical "know-how" on the all-jet, all-wing configuration to lay down a long-range development of the YB-49 Jet Wing. Assuming an initial gross weight of 215,000 lb., a B-49B mounting eight J-47 jets can be shown capable of a maximum range of 6500 miles with a 30,000-lb. bomb load and 8000 miles with 10,000 lb.

The optimum range cruising speed would be 460 mph., which is equal to the all-out

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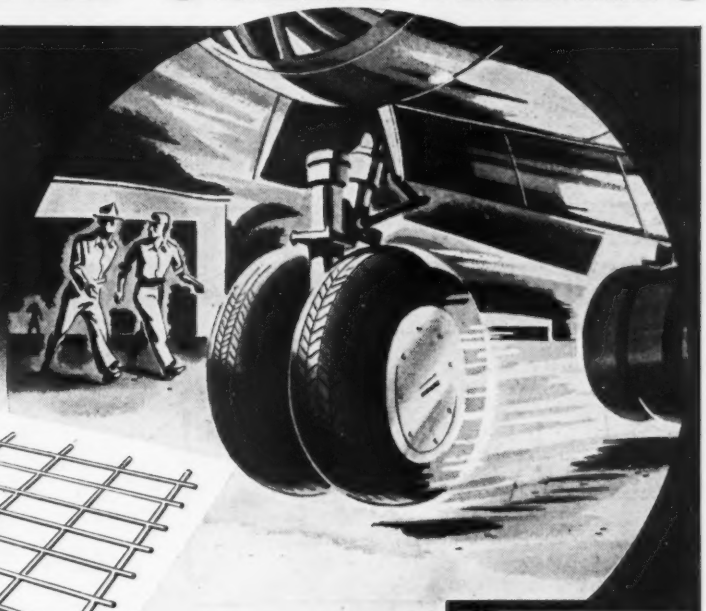

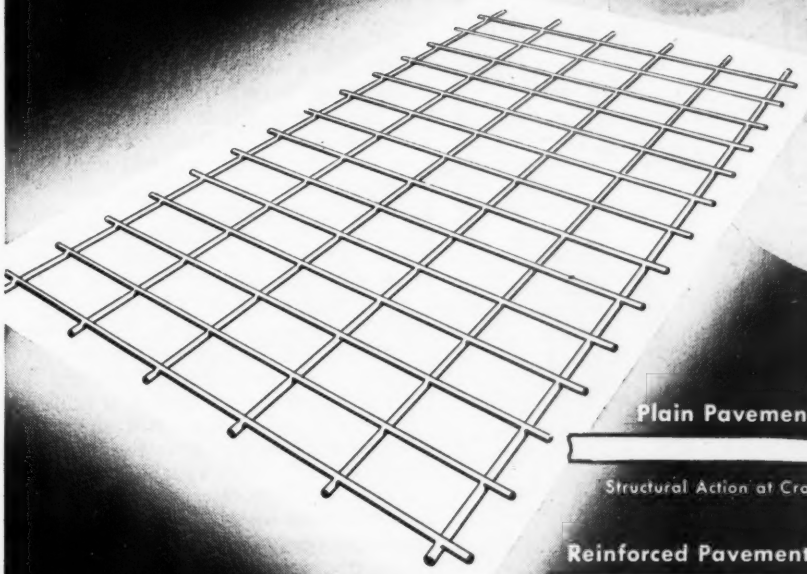

Note that as heavy wheel load approaches crack in plain pavement, slab end carries entire load weight with no assistance from non-loaded slabs.

Plain Pavement (W) Open Crack

Structural Action at Crack in Plain, Non-Reinforced Pavement

Reinforced Pavement (W) Closed Crack

Structural Action at Crack in Truscon Welded Steel Fabric-Reinforced Pavement

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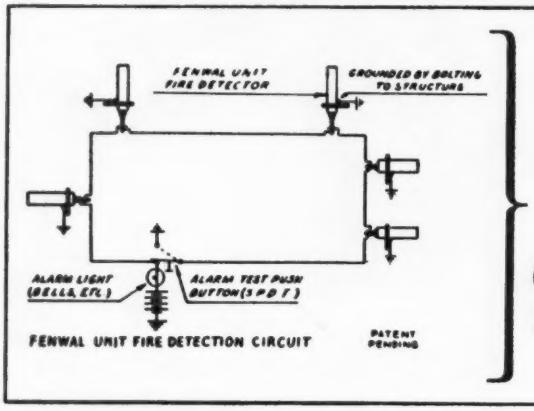
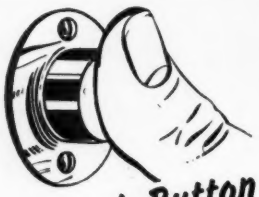

FENWAL UNIT FIRE DETECTOR
GROUNDED BY BOLTING TO STRUCTURE
ALARM LIGHT (BELL & ETC.)
ALARM TEST PUSH BUTTON (S.P.D.T.)
FENWAL UNIT FIRE DETECTION CIRCUIT
PATENT PENDING



One Push Button Checks the Entire Loop Circuit

UNIQUE FENWAL SAFETY CIRCUIT . . . single conductor loop circuit with ground return . . . *detectors operate even if conductor is accidentally broken anywhere in the circuit* . . . even a double break only eliminates detectors located between breaks; others remain operative. Each detector operates independently — no averaging effects. This safety circuit is exclusive with Fenwal!

NO BULKY PANELS, SUPERVISORY INSTRUMENTATION OR RELAY SYSTEMS to buy, check and maintain.

Temperature-sensitive unit is the hermetically sealed stainless steel shell which protects the internal actuating mechanism. Weighs only 2 ounces. Gives fast response . . . positive protection. Built-in rate of rise bias eliminates thermal lag, assuring instant, positive, fixed temperature response under all conditions. Unaffected by vibration . . . calibration permanently set at factory. Repeatable . . . detects over-heat or actual fire and resets itself.

The Fenwal Aircraft Fire and Over-Heat Detector fully complies with CAA Technical Standard Order C11 in accordance with S.A.E. Specifications AS-401. Write for data: Fenwal Incorporated, 77 Pleasant Street, Ashland, Massachusetts.

Fenwal
THERMOSWITCH*
*Reg. U.S. Pat. Off.
Aircraft Fire and Over-Heat Detectors
SENSITIVE . . . but only to heat

combat emergency speed of the B-36D with six piston engines and four jets being thrashed to the limit. Furthermore, the target ceiling with a 10,000 lb. bomb load (gross weight 148,000 lb.) would be 52,000 ft.

▶ **Jets at Altitude**—In case these figures look a little rosy-tinted in favor of the jet, we should say that our altitude thrust ratings are based on British engine data covering mostly radial-compressor turbojets, such as the Rolls-Royce Nene and the de Havilland Ghost. Both these engines are known to have excellent altitude performances probably not yet equalled by American axial-compressor types, but both the General Electric J-47 and the later series Allison J-35 may be expected to approach them in the near future. At the tropopause (35,000 ft.), for example, the British jets develop a net propulsive thrust at 500 mph. of roughly 44 percent of their sea level static rating while at 600 mph. the thrust ratio is well over 50 percent.

The essential military fact back of all this is that the jet bomber is very much in its natural habitat at high stratospheric levels, since as the fuel is consumed it pays to climb a flat aerial hill at high constant cruising speed, gaining altitude all the way to the target and throughout the return journey. "The higher, the faster, the farthest," in fact, sums up the jet air age.

This contrasts with the piston engine bomber which, for optimum range, must fly slower as its gross weight decreases. This classic piston engine millstone is verified by the low overall cruising speed of the B-36.

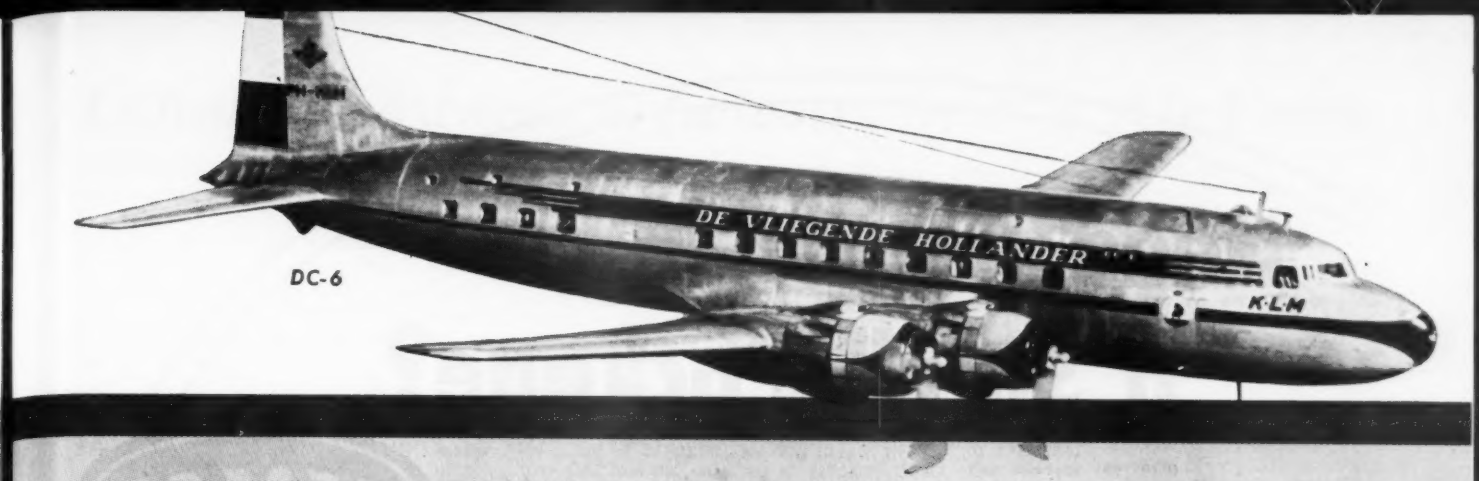
▶ **Wrong Horse**—Whether the jet bomber will ultimately catch up with the jet fighter because of the machinations of Dr. Mach is another story for another time. But in the current state of the engineering art—and remembering what happened to Goering's bombers in the Battle of Britain—we fancy any fighter pilot would relish the chance of meeting up with such a large and lumbering target as the B-36. What is surprising, therefore, is that with two such promising jet bomber potentials as the B-47 and the B-49, the U. S. Air Force chieftains should prefer to back the B-36—presumably on the scoring point of range, and range only.

This technical error on the part of U. S. military planning largely stems, we think, from a false psycho-political evaluation of the ultra-long-range bomber as the big stick deterrent of the future.

Actually, two fundamental changes have taken place in the strategic bomber spectrum since the B-36 was conceived—the proved practicability of air refuelling, and the use of advanced bases on friendly soil. Both of these implications reduce the range problem to sounder engineering economics and clearly point to smaller medium-range jets with high stratospheric performance . . .

As a British observer sitting on the side lines with a slide-rule, we believe that the American taxpayer is being taken for a ride up a long and unprofitable side alley which can only end in a technical cul-de-sac. It seems to us that if this piston-engine gigantism is pursued much further, the fire brigade will not only cost more than the fire, but most of the fire-engines will be lost in the funeral pyre.

HAROLD SAXON, F.R.Ae.S.
London, Eng.



DC-6

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Air lines all over the world have a preference for Vickers Hydraulic Equipment . . . not only on the main hydraulic system but also on the independent system for cabin pressurization and air conditioning.

K.L.M. Royal Dutch Airlines, now celebrating its 30th anniversary of operation, is using DC-6, Constellation and Convair planes in its widespread operations. All of these make extensive use of Vickers hydraulics.

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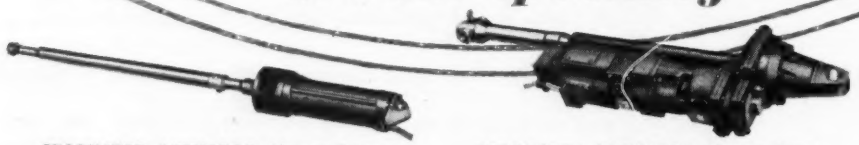
Just as during the war, EEMCO has continued on into peacetime its concentration on serving the aircraft industry... performing a specialized design, development, engineering and manufacturing service. Leading aircraft builders have asked us to contribute to some of the most important aircraft of the last decade, and to many more now under development. EEMCO-built motors and actuators have solved the very toughest problems of function, power, size, weight, shape, performance, installation and operation. Let EEMCO tackle *your* problem.

Actuators and Motors like these ...of difficult and unusual design... are our specialty

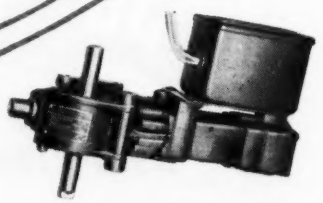


STABILIZER ACTUATOR, Linear Type

Motor inline with screw. Magnetic clutch. Radio noise suppressors. Travel limit switches. Weight, 14 lbs. Normal load, 2500 lbs. Rate of travel, half-inch per second.

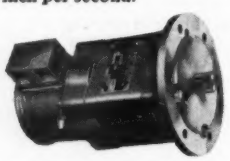
STABILIZER ACTUATOR, Linear Type

Magnetic clutch, radio noise suppressors. Normal load 2500 lbs. Maximum load, 8,000, static, 20,000 lbs. Stroke 7-1/2 in. Rate of travel, .62 inches per second. Weight, 17 lbs. Non-jamming end stops.



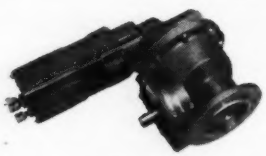
CANOPY ACTUATOR FOR JET FIGHTER

Rotary type, with manual overdrive and radio noise filter. 81 R.P.M. on the double end output shaft. 150 inch-lbs. torque. Weight, 6-1/4 lbs.



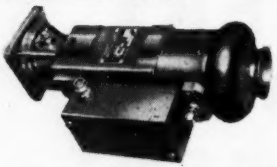
STARTER-GENERATOR FOR JET TURBINE

12 or 24 volts. 70 inch-lbs. torque at 2000 R.P.M. as a starter. Continuous output as a generator—35 amps at 12 volts, 15 amps at 24 volts. Weight, 15 lbs.



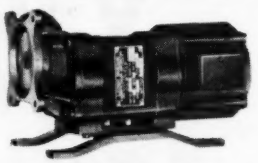
VARI-CAM ROTARY ACTUATOR

Magnetic clutch and brake. Overload torque limiter. Provision for manual operation.



HYDRAULIC PUMP DRIVE MOTOR

Open through ventilated for continuous duty. 3-3/4 H. P. continuous. Equipped with radio noise filter and integral gear reduction . . . Weight, 23-3/4 lbs.



EXPLOSION PROOF AILERON BOOSTER MOTOR

Explosion proof, continuous duty. 1-1/2 H. P. continuous duty rating. Peak intermittent duty rating, 2.7 H.P.

EXPLOSION-PROOF MOTOR EQUIPPED WITH AIR DUCTS

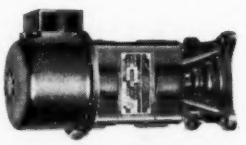
Intake and exhaust ducts for external air cooling. Continuous rating of 4 H.P. with a ram of 12-inch head of water pressure; 2-1/2 H.P. when drawing its own air for cooling. Intermittent peak output, 7 H.P. 27 volts, 9000 R.P.M. Weight, 19-1/4 lbs.

DRIVE MOTOR FOR RADAR SCANNER

400 watts output continuous. 12,000 R. P. M. reversible. 600 watts peak load. Weight, 4-1/2 lbs.

PILOT SEAT ACTUATOR MOTOR AND CLUTCH

30 second duty cycle, 1/2 minute out of 10 minutes at 95 watts output. Weight, 18 oz. Specifications can be varied to suit special conditions.



AILERON BOOSTER MOTOR

Open through ventilated for continuous duty operation. Integral gear reduction. Weight, 12 lbs. 2 H. P. continuous rating.

TELL US YOUR REQUIREMENTS

Check with us on a current motor or actuator design problem.
Give us the following preliminary data:
Type of unit • Specific function • Special requirements • Operating conditions • Motor and actuator specifications
Any available drawings, diagrams, and tables should be provided.

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Latest Bid Awards to Industry by U. S. Air Force

Air Materiel Command Procurement Division makes available to AVIATION WEEK the latest bid awards, shown on this page. Requests for further information should be addressed to Contracting Officer, AMC, Wright-Patterson AFB, Dayton, Ohio, attention: MCPPSX72, (AMC will resume in the near future the issuance of data on invitations for bids.)

ABSTRACTS

For 17,956 feet radio frequency cables (49-2380):
Federal Telephone & Radio Corp., East Newark, N. J., on a bid of $2795.75.

For hoists (49-2136):
Companies sharing—Whiting Corp., Harvey, Ill., on a bid of $5658.10; Keller Tool Co., Grand Haven, Mich., on a bid of $10,024, and Vulcan Copper & Supply Co., Cincinnati, on a bid of $9189.12.

For 1100 pounds acid (49-2050):
Companies sharing—Consolidated Chemical Industries, Inc., Houston, on a bid of $12,438.48; Virginia-Carolina Chemical Corp., Chemicals Div., Richmond, on a bid of $1631; Monsanto Chm. Co., St. Louis, on a bid of $32,928; City Chemical Corp., New York, on a bid of $7809; Detroit Chemical Works, Detroit, on a bid of $6972, and General Chemical Div., Allied Chemical & Dye Corp., New York, on a bid of $19,679.20.

For 9000 pumps, cushions, thimbles, etc. (49-2308):
Companies sharing—Peters & Russell, Inc., Springfield, O., on a bid of $2675; American Auto-Felt Corp., Grand Rapids, on a bid of $9905, and Tietzmann Tool Corp., Englewood, O., on a bid of $225.

For services (49-1908):
Shea-Matson Trucking Co., Milwaukee, on a bid of $28,873.50.

For relay banks & spares (49-2425):
Aermotive Equipment Corp., Kansas City, Mo., on a bid of $6439.50.

For timer assemblies (49-2151):
Companies sharing — Aermotive Equipment Corp., Kansas City, Mo., on a bid of $29,923.60; Cardell Manufacturers, Dayton, on a bid of $7681, and Standard Electric Time Co., Springfield, Mass., on a bid of $15,600.

For propeller dolly (49-1786):
Welded Construction Engineering Co., Cleveland, on a bid of $35,565.10.

For antennas (49-1720):
Super Electric Products Corp., Jersey City, on a bid of $138,922.87.

For valves (49-1408):
Companies sharing—Kohler Co., Kohler, Wis., on a bid of $13,915.25, and Parker Appliance Co., Cleveland, on a bid of $105,958.80.

For bushings (49-1852):
Companies sharing — Weatherhead Co., Cleveland, on a bid of $9035; Deutsch Co., Los Angeles, on a bid of $7077; Kings Electronics Co., Inc., Brooklyn, on a bid of $510; Sanford Aircraft, Inc., Inglewood, Calif., on a bid of $7088; Rod Cutting Co., Cleveland, on a bid of $5536.20; Irvin W. Masters, Inc., Burbank, on a bid of $1878.50; Parker Appliance Co., Cleveland, on a bid of $2053.50; Pacific Piston Ring Co., Los Angeles, on a bid of $1802; Hyland Machine Co., Dayton, on a bid of $108; Salvesen Brothers, Crystal Lake, Ill., on a bid of $2850, and Aircraft Fitting Co., Cleveland, on a bid of $1350.

For 1085 .50 caliber guns (49-1878):
Consolidated Radio Products Co., Chicago, on a bid of $7475.65.

For 23,600 insulators (49-1898):
Companies sharing—Lord Manufacturing Co., Erie, Pa., on a bid of $1413.10, and General Tire & Rubber Co., Wabash, Ind., on a bid of $4040.

For photographic supplies (49-1948):
Companies sharing—General Aniline & Film Corp., Anesco Div., Binghamton, on a bid of $2952; E. I. du Pont de Nemours & Co., Inc., Photo Products, Dept., Wilmington, Delaware, on a bid of $68,805; Eastman Kodak Co., Rochester, on a bid of $22,535.37; Anken Chemical & Film Corp., Newton, N. J., on a bid of $20,676.48; Gevaert Co. of America, Inc., New York, on a bid of $7521.26; Haloid Co., Rochester, on a bid of $18,076.76, and Grant Photo Products, Inc., Lakewood, O., on a bid of $10,973.10.

For tool assemblies (49-1542):
Companies sharing—L. M. Engineering Co., Los Angeles, on a bid of $2089; Loeffler Tool & Die Co., Detroit, on a bid of $212.50; Parker Pattern & Foundry Co., Springfield, on a bid of $1802.50; Marion Screw Products Co., Marion, on a bid of $212.50; Buel Machine Co., Woburn, on a bid of $322.50; H. G. Dykeman Co., Dayton, on a bid of $121.50, and Neal Machine & Tool Co., Lima, on a bid of $3422.

For phenolic sheets (49-1902):
Companies sharing—Taylor Fibre Co., Norristown, on a bid of $10,155.70; General Electric Co., Coshocton, on a bid of $92.16; Synthane Corp., Oaks, on a bid of $980, and Continental Diamond Fibre Co., Newark, Del., on a bid of $1149.49.

For adapter assemblies (49-1909):
Scott-Browne Corp., Newton, on a bid of $10,740.

For cords (49-1943):
Companies sharing—Kas-kel Electric Co., Inc., New York, on a bid of $5065, and Westinghouse Electric Supply Co., Dayton, on a bid of $6922.10.

For generator switches (49-1982):
Hartman Electrical Mfg. Co., Mansfield, O., on a bid of $32,802.30.

For motion film picture cans (49-2020):
Waco Aircraft Co., Troy, O., on a bid of $13,500.

For hydro steam cleaner (2031):
Siebring Mfg., Co., George, Ia., on a bid of $4505.

For kit-seawater distillation (49-2171):
Breslee Mfg. Co., Inc., New York, on a bid of $38,444.

For film (49-2183):
E. I. du Pont de Nemours & Co., Inc., Wilmington, on a bid of $36,141.90.

For batteries (49-2219):
National Battery Co., Penew, N. Y., on a bid of $14,936.

For bags, cushions, holders, etc., (49-2312):
Companies sharing—Technicraft Corp., Kansas City, Mo., on a bid of $1173; McVeigh Industries, Inc., Detroit, on a bid of $5653.08; Transparent Specialties Corp., Cleveland, on a bid of $1086.40, and G. Felsenthal & Sons, Inc., Chicago, on a bid of $2400.

For steel welding electrodes (49-1783):
Companies sharing—General Electric Co., Schenectady, on a bid of $3146.31, and Reid Avery Co., Baltimore, on a bid of $185.

For 163 demonstrator trainers (49-1800):
Companies sharing—American Automatic Typewriter Co., Chicago, on a bid of $18,960; Imagineering Associates, Inc., Hollywood, on a bid of $2120.40; Ram Meter Service, Ferndale, Mich., on a bid of $960; Welch Electric Co., Cincinnati, on a bid of $8825; Plastic Mfgrs. & Designers Corp., Indianapolis, on a bid of $1800, and G. W. Holmes Co., Columbus, on a bid of $438.30.

For 6468 toggle switches (49-1875):
Cutler-Hammer Inc., Cincinnati, on a bid of $10,672.20.

For fitting assemblies (49-1924):
Companies sharing—Flex-O Tube Co., Detroit, on a bid of $4203.20; Aeroquip Corp., Jackson, Michigan, on a bid of $48,672; The Weatherhead Co., Cleveland, on a bid of $1215, and Clark Metal Products, Inc., on a bid of $31,844.80.

For various chemicals (49-1998):
Carbide & Carbon Chemicals Corp., New York, on a bid of $31,052.70, and Octagon Process, Inc., Brooklyn, on a bid of $22,792.

For 1400 adapters & brackets (49-2026):
Companies sharing—R. G. Dykeman Co., Dayton, on a bid of $844; Rocky Mountain Steel Products Inc., Los Angeles, on a bid of $5856, and Arthur Gales Mach. Co., Racine, Wis., on a bid of $1850.

For 2006 heaters (49-1940):
Companies sharing—The Martin Electric Co., Dayton, on a bid of $3878.50, and Edwin L. Wiegand Co., Pittsburgh, on a bid of $6200.48.

For relays (49-1983):
Companies sharing—Hartman Electrical Mfg. Co., Mansfield, Ohio, on a bid of $86,024.40, and Phaostron Co., South Pasadena, Calif., on a bid of $132,852.72.

For 13,250 light assemblies (49-1984):
Graybar Electric Co., Inc., Dayton, on a bid of $16,165.

For 12 kit assemblies (49-1933):
Rhodes Lewis Co., Los Angeles, on a bid of $2838.24.

For sanders (49-2040):
Companies sharing—Skilsaw, Inc., Chicago, on a bid of $2002.56, and Sterling Tool Products Co., Chicago, on a bid of $7095.36.

For 6 cameras (49-2046):
Bell & Howell Co., Chicago, on a bid of $6297.06.

For rack assemblies (49-2054):
Dayton Aircraft Products, Inc., Dayton, on a bid of $41,428.99.

For resistors (49-2221):
Companies sharing—Chicago Telephone Supply Corp., Elkhart, on a bid of $65.92; Neptune Electronics Co., New York, on a bid of $1380; Standard Electrical Products Co., Dayton, on a bid of $574.40, and Ward Leonard Electric Co., Mount Vernon, N. Y., on a bid of $1607.00.

For 3400 cable assemblies (49-2264):
Hines Equipment Co., St. Louis, on a bid of $47,059.50.

For 380 harness assemblies (49-2274):
Pioneer Parachute Co., Inc., Manchester, Conn., on a bid of $70,612.40.

For 550 photographer's equipment (49-2329):
Companies sharing—Bausch & Lomb Optical Co., Rochester, on a bid of $637.50, and Projection Optics Co., Inc., Rochester, on a bid of $3800.

For 10 engine overhaul stands (49-2350):
Columbia Machinery & Engineering Corp., Hamilton, on a bid of $7320.40.

For gears & gearcases (49-1978):
Companies sharing — Continental Electronics, Ltd., Brooklyn, on a bid of $28,230, and Dexter Machine Products, Inc., Chelsea, Mich., on a bid of $7106.

For office equipment (49-2012):
Companies sharing — Everybodys Office Outfitters, Inc., Dayton, on a bid of $30,210, and Chas. G. Stott & Co., Inc., Washington, D. C., on a bid of $5589.

For 10,000 pounds protective wax (49-2014):
Simoniz Co., Chicago, on a bid of $3150.

For aircraft cabin heater testers (49-2043):
Greer Hydraulics, Inc., Brooklyn, on a bid of $20,210.

For 374 magnifiers (49-2079):
Companies sharing—Compass Instrument & Optical Co., New York, on a bid of $276.75, and Reiner Electronics Co., Inc., New York, on a bid of $10,501.84.

For aircraft maintenance parts (49-2092):
Companies sharing—American Phenolic Corp., Chicago, on a bid of $4892; Graybar Electric Co., Dayton, on a bid of $331; Scintilla Magneto Division, Bendix Aviation Corp., Sidney, N. Y., on a bid of $52, and Cannon Electric Development Co., Los Angeles, on a bid of $8591.15.

For countersink holders (49-2159):
Aircraft Tools, Inc., Los Angeles, on a bid of $14,770.

For gages & indicators (49-2163):
Kollsman Instrument Div., Square D Co., Elmhurst, N. Y., on a bid of $4,195.68.

For dynamotors (49-2166):
Fisher Research Laboratory, Inc., Palo Alto, on a bid of $10,548.

For clothing (49-2181):
Companies sharing—Premium Cap Co., St. Louis, on a bid of $13,413.60; Sigmund Eisner Co., Red Bank, N. J., on a bid of $514,664; L. W. Foster Sportswear Co., Inc., Philadelphia, on a bid of $64,860.30, and Rainier Inc., Brooklyn, on a bid of $115,383.06.

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American Non-Gran Bronze is an experienced contract manufacturer. Our experience on production runs of parts—in any metal—machined to .0005" and in bronze castings stems from 40 years' experience. We are currently serving leading concerns in the aircraft industry. They have found our service profitable. You may also.

When you have work that is hard to do economically—or just hard work—we want it. Write for descriptive folder.

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Metropolitan Philadelphia

For capacitors (49-1974):
Companies sharing — Hammarlund Mfg. Co., Inc., New York, on a bid of $74.40; Concord Radio Corp., Chicago, on a bid of $198; Collins Radio Co., Cedar Rapids, on a bid of $80; Cornell Dubilier Elec. Corp., South Plainfield, N. J., on a bid of $549.69; Western Electric Co., Inc., New York, on a bid of $1489.50; Sprague Electric Co., North Adams, Mass., on a bid of $115.50; Tobe Deutschmann Corp., Norwood, Mass., on a bid of $113.75; Sangamo Electric Co., Springfield, Ill., on a bid of $618, and Aerovox Corp., New Bedford, Mass., on a bid of $156.50.

For 392 desks (49-2191):
Everybodys Office Outfitters, Inc., Dayton, on a bid of $28,756.14.

For 800 desks (49-2285):
Roth Office Equipment Co., Dayton, on a bid of $54,650.

For metal shears (49-2207):
Skilsaw, Inc., Chicago, on a bid of $2747.

For indicators (49-2293):
Kollsman Instrument Div. of Square D Co., Elmhurst, N. Y., on a bid of $6520.56.

For 1700 valve & filter assemblies (49-2331):
Companies sharing — Parker Appliance Co., Cleveland, on a bid of $540, and Weatherhead Co., Cleveland, on a bid of $9700.

For indicators (49-2351):
Lewis Engineering Co., Naugatuck, Conn., on a bid of $15,132.98.

For pumps (49-2364):
Niles-Bement-Pond Co., Chandler-Evans Div., West Hartford, Conn., on a bid of $40,219.72.

For 1970 mount & adapter assemblies (49-2366):
Companies sharing—Green Machine Co., Inc., East Hartford, Conn., on a bid of $588.60, and Precision Aviation Products, Inc., Buffalo, on a bid of $6110.

For flashers (49-2369):
Seaboard Electric Co., New York, on a bid of $14,227.

For sodium sulphite (49-2443):
Companies sharing—Eastman Kodak Co., Rochester, on a bid of $6300; Standard Products Co., Philadelphia, on a bid of $1175; Octagon Process Inc., Brooklyn, on a bid of $762; Philip A. Hunt Co., Brooklyn, on a bid of $9950, and Mallinckrodt Chemical Works, St. Louis, on a bid of $8662.50.

For 873 superchargers (49-2454):
H. Bachus & Sons, Wichita, on a bid of $24,957.

For printing services (49-2460):
Companies sharing — Milne-Orr, Inglewood, Calif., on a bid of $30,000, and Ewing Printing Co., Los Angeles, on a bid of $65,000.

For capacitors (49-2462):
California Electronics Supply, Inc., Los Angeles, on a bid of $7616.

For hose (49-2466):
Companies sharing — Weatherhead Co., Cleveland, on a bid of $2007.50; Irvin W. Masters, Inc., Burbank, on a bid of $470, and Pacific Piston Ring Co., Los Angeles, on a bid of $1280.

For pencil sharpeners, rulers, & adhesive tape (49-1560):
Companies sharing—McConnaughey Stationers, Inc., Springfield, O., on a bid of $33,421.14; Van Cleef Bros., Inc., Chicago, on a bid of $100,090.20, and Hampton Mfg. Co., Carlstadt, N. J., on a bid of $9027.45.

For 1210 swivel chairs (49-1680):
Companies sharing—Roth Office Equipment Co., Dayton, on a bid of $37,166.10, and McConnaughey Stationers, Inc., Springfield, O., on a bid of $3358.25.

For photographic equipment (49-1789):
Companies sharing—Anken Chemical & Film Corp., Newton, N. J., on a bid of $1838.80; Haloid Co., Rochester, on a bid of $22,549.29; Eastman Kodak Co., Rochester, on a bid of $12,576.78, and General Aniline & Film Corp., Ansco Div., Binghamton, on a bid of $8294.31.

For ammeters (49-2025):
Maritime Switchboard, New York, on a bid of $3649.92.

For test stands (49-2074):
United Mfg. Co. Div., United Advertising Corp., New Haven, on a bid of $63,427.36.

For corrector & solution (49-2111):
Companies sharing—Ferd Wagner Co., Cincinnati, on a bid of $1350; Dayton Blue Print Co., Dayton, on a bid of $250, and General Aniline & Film Corp., Binghamton, on a bid of $1704.

For fire protective system (49-2123):
Cardox Corp., Chicago, on a bid of $23,428.

For microfile viewers (49-2232):
Leroy M. E. Clausing, Chicago, on a bid of $16,850.

For photographic material (49-2260):
Companies sharing—Bell & Howell Co., Chicago, on a bid of $24,039.51; Hubbell & Miller Co., New Rochelle, N. Y., on a bid of $5072.35; Graflex, Inc., Rochester, on a bid of $16,800; Radiant Manufacturing Corp., Chicago, on a bid of $5595; Ednalite Optical Co., Inc., Peekskill, N. Y., on a bid of $517; Bausch & Lomb Optical Co., Rochester, on a bid of $3500, and Burke & James, Inc., Chicago, on a bid of $995.

For photographic equipment (49-2269):
Companies sharing—Eastman Kodak Co., Rochester, on a bid of $2677.98, and Anken Chemical & Film Corp., Newton, N. J., on a bid of $1949.80.

For transformer assemblies (49-2284):
General Electric Co., Schenectady, on a bid of $5460.

For door fitting (49-2287):
Companies sharing—B. F. Goodrich Co., Akron, on a bid of $10,989.50; United States Rubber Co., Mishawaka, Ind., on a bid of $9701; Firestone Tire & Rubber Co., Los Angeles, on a bid of $2712.50, and Goodyear Tire & Rubber Co., Akron, on a bid of $412.50.

For generator assemblies (49-2175):
Jack & Heintz Precision Industries, Inc., Cleveland, on a bid of $500,820.

For blades (49-2177):
Companies sharing—Simonds Saw & Steel Co., Chicago, on a bid of $630; Factory & Yard Supply Co., New York, on a bid of $775; Henry Disston & Sons, Inc., Philadelphia, on a bid of $1224; John L Howte Co., Woburn, Mass., on a bid of $2560; Ace Drill Corp., Detroit, on a bid of $2460; Engelberg Huller Co., Inc., Syracuse, on a bid of $2400; Black Mfg. Co., Parkton, Md., on a bid of $9250; Hays Mfg. Co., Columbus, O., on a bid of $2590, and Kennedy Manufacturing Co., Van Wert, O., on a bid of $5875.

For 18,452 gallons polish aluminum (49-2187):
R. M. Hollingshead Corp., Camden, N. J., on a bid of $6236.77.

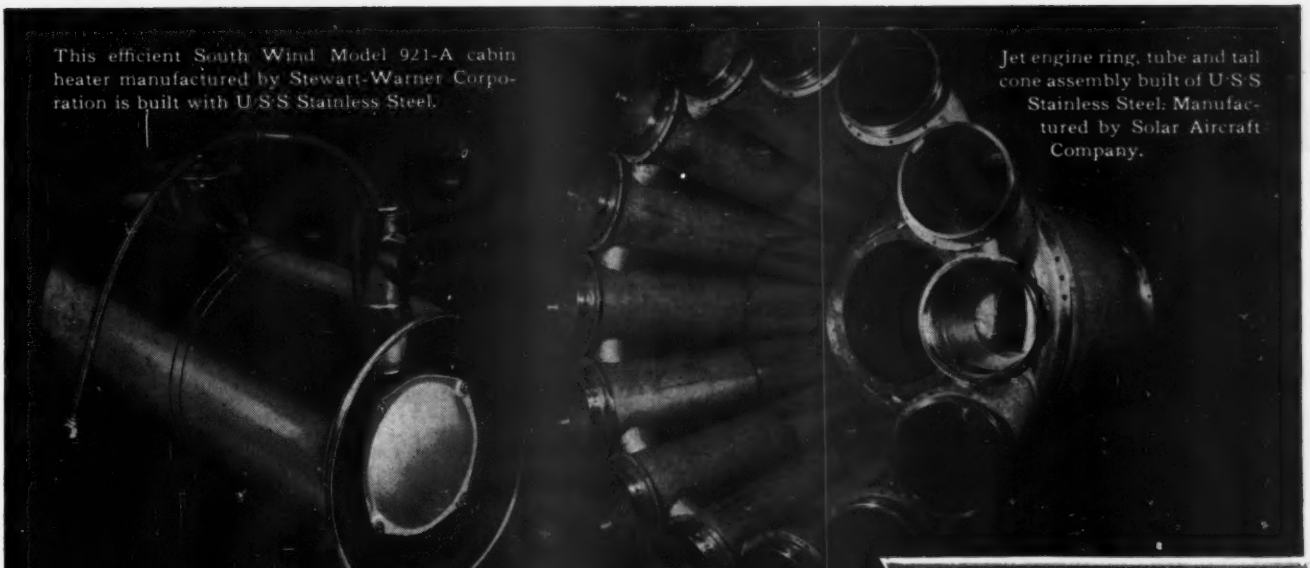
For inverters (49-2352):
Eicor, Inc., Chicago, on a bid of $14,193.42.

For photographic equipment (49-678):
Companies sharing—Hubbell & Miller Co., New Rochelle, N. Y., on a bid of $7777.50, and G. M. Mfg. Co., New York, on a bid of $2112.

For 112 hose assemblies (49-1200):
Weatherhead Co., Cleveland, on a bid of $17,856.

For enamel (49-1362):
Companies sharing — Sherwin-Williams Co., Cleveland, on a bid of $243,042.94; Glidden Co., Cleveland, on a bid of $122,224.80; W. P. Fuller & Co., Los Angeles, on a bid of $8894.64; Andrew Brown Co., Los Angeles, on a bid of $64,711.30; Division of American Marietta Co., Cleveland, on a bid of $128,585.04; Titanins, Inc., Union, N. Y., on a bid of $22,081.20; Pittsburgh Plate Glass Co., Houston, on a bid of $4378.80, and Capitol Paint & Varnish Works, Inc., Brooklyn, on a bid of $2907.90.

For Capacitors (49-1436):
Companies sharing — Cornell Dubilier Electric Corp., South Plainfield, N. J., on a bid of $137.50; General Electric Co., Dayton, on a bid of $292.50; Sangamo Electric Co., Springfield, Ill., on a bid of $2947.70; Sprague Electric Co., North Adams, Mass., on a bid of $342.25; P. R. Mallory & Co., Inc., Indianapolis, on a bid of $231; Peerless Radio Distributors, Inc., Jamaica, N. Y., on a bid of $1223.60; Bell & Howell Co., Chicago, on a bid of $212; Erie Resistor Corp., Erie, Pa., on a bid of $201.50; and Cornell Dubilier Electric Corp., South Plainfield, N. J., on a bid of $496.

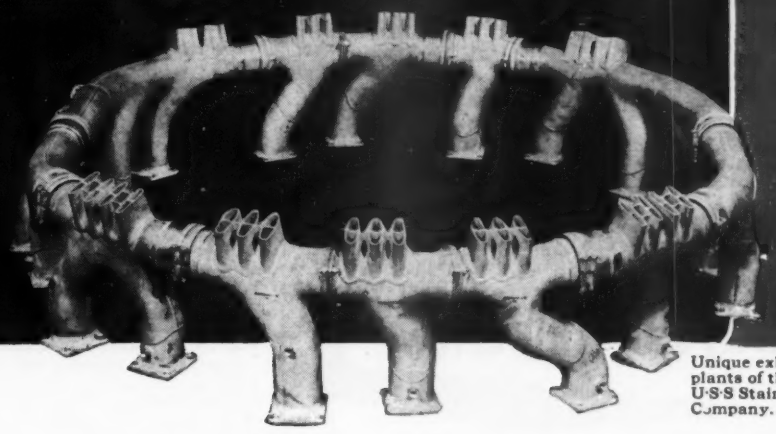


This efficient South Wind Model 921-A cabin heater manufactured by Stewart-Warner Corporation is built with U·S·S Stainless Steel.

Jet engine ring, tube and tail cone assembly built of U·S·S Stainless Steel. Manufactured by Solar Aircraft Company.

FOR IMPORTANT PARTS LIKE THESE

—it pays to use U·S·S Stainless!



Unique exhaust system for one of the two power plants of the Lockheed P2V Neptune. Built with U·S·S Stainless Steel by the Ryan Aeronautical Company.

THREE manufacturers, well-known in the aircraft industry—Ryan, Solar and Stewart-Warner—are represented in the products shown here. All use U·S·S Stainless Steel because in this *perfected*, service-tested steel they are insured a consistent uniformity of composition, finish and fabricating qualities that allows them the widest latitude in design and permits them to employ the most advanced manufacturing techniques.

U·S·S Stainless Steel admirably meets the stringent requirements for airframe and engine parts that must have not only high resistance to corrosion, oxidation and cavitation but must maintain these properties at extremely high temperatures for many hours at a stretch. It lends itself readily to intricate forming, to gas, arc and resistance welding and other fabricating processes.

To help you apply U·S·S Stainless Steel to insure optimum results both in its fabrication and in its performance, we offer you the practical cooperation of our engineers. They will gladly show you how to realize the fullest advantage from its use.

USS STAINLESS STEEL — UNITED STATES STEEL

U·S·S STAINLESS STEEL

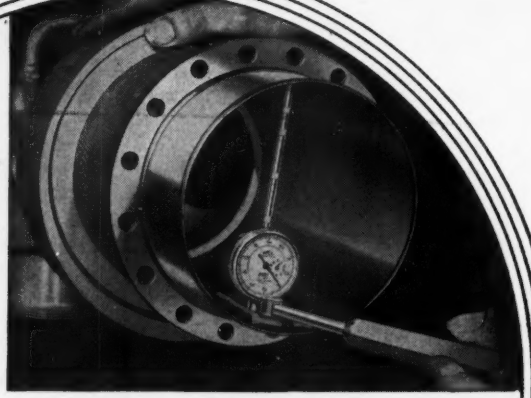
SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

8-566

UNITED STATES STEEL AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago & New York
CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh & Chicago • COLUMBIA STEEL COMPANY, San Francisco
NATIONAL TUBE COMPANY, Pittsburgh • TENNESSEE COAL, IRON & RAILROAD COMPANY, Birmingham
UNITED STATES STEEL SUPPLY COMPANY, Warehouse Distributors—Coast to coast: UNITED STATES STEEL EXPORT COMPANY, New York

AMES

Instantly Accurately Safely . . .



GAUGE ALL AIRCRAFT CYLINDERS

Ames No. 29T Cylinder Gauge provides the *quickest, safest* means of precisely measuring aircraft cylinders. Insert gauge into cylinder—as you move handle, read *.0001" graduated dial.* It shows instantly, accurately all you want to know about diameter, straightness, roundness. No danger of scoring highly finished cylinder walls because contact pressure is extremely light, allowing gauge to be moved freely, safely in and around cylinder. Ames No. 29T Aircraft Cylinder Gauge comes in fitted metal box with full set of indicator extension points and instructions.

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LEACH RELAY COMPANY has been in business for over 30 years designing, modifying and developing thousands of types of relays for thousands of applications. Leading civilian and military aircraft manufacturers *specify* LEACH RELAYS as standard equipment. These include AN, AAF and NAF types; also included are AAF approved substitutes for AN relays. New designs and modifications are in a constant stage of development for specific requirements.

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Representatives in Principal Cities of U. S. and Canada

For 540 rack assemblies (49-2434):
House of Jackson, Glendale, on a bid of $6247.80.

For wetting agent (49-2048):
Companies sharing—Fischer Industries, Inc., Cincinnati, on a bid of $4975; Octagon Process, Inc., Brooklyn, on a bid of $34,472; Miami Products & Chemical Co., Dayton, on a bid of $1120, and Phipps Products Co., Boston, on a bid of $6095.05.

For aircraft radio laboratory (49-1682):
Fogarty Electric Co., Cincinnati, on a bid of $73,777.

For Filters (49-1701):
Hallicrafters Co., Chicago, on a bid of $34,411.50.

For 17 trainers (49-1797):
Companies sharing—Management & Research, Inc., Primes, Pa., on a bid of $415; G. Felsenthal & Sons, Inc., Chicago, on a bid of $452.50, and American Automatic Typewriter Co., on a bid of $15,350.

For test sets (49-1812):
Lavoie Laboratories, Morganville, N. J., on a bid of $27,499.56.

For 390 reels (49-1839):
Companies sharing — General Electric Supply Corp., Dayton, on a bid of $3593.20, and Baltinger Electric Co., Inc., New York, on a bid of $6450.50.

For adapters, bolts, & nuts, etc. (49-1861):
Companies sharing — Aircraft Products Co., Clifton Heights, Pa., on a bid of $1238.45; Rod Cutting Co., Cleveland, on a bid of $1477.50; Aero Supply Mfg. Co., Inc., Corry, Pa., on a bid of $217.50; Standard Pressed Steel Co., Jenkintown, Pa., on a bid of $2616.62; Elastic Stop Nut Corp. of America, Union, N. J., on a bid of $6659.94, and Dzus Fastener Co., Inc., Babylon, N. Y., on a bid of $528.13.

For rheostats (49-1881):
Companies sharing—Hughes-Peters, Inc., Dayton, on a bid of $264; Ohmite Mfg. Co., Chicago, on a bid of $1878.72; Neptune Electronics Co., New York, on a bid of $360; U. S. Radio Supply, Chicago, on a bid of $359.50; Radio Shack Corp., Boston, on a bid of $867.60, and Ward Leonard Electric Co., Mount Vernon, N. Y., on a bid of $143.

For accoustical treatment control rooms (49-1884):
Myron Cornish & Co., Dayton, O., on a bid of $27,700.

For 685 tow targets (49-1910):
I. Miller & Sons, Inc., Long Island City, N. Y., on a bid of $22,310.45.

For 10,730 yards cheesecloth (49-1919):
Companies sharing—R. P. Clarke Co., Washington, D. C., on a bid of $99.60; W. Harris Thurston, Inc., New York, on a bid of $681; L. W. Guild Co., Inc., Boston, on a bid of $4095, and Batavia Mills, Inc., New York, on a bid of $2606.25.

For electric terminals (49-2023):
Companies sharing — Patton-MacGuyer Co., Providence, on a bid of $144.05; H. B. Sherman Mfg. Co., Battle Creek, on a bid of $1884.26; Aircraft-Marine Products Inc., Harrisburg, Pa., on a bid of $31.82; Winslow Co., Newark, on a bid of $817; Balknap Hdw. & Mfg. Co., Inc., Louisville, on a bid of $799.48; General Electric Supply Corp., Dayton, on a bid of $10,810.96, and Graybar Electric Co., Inc., Dayton, on a bid of $34.02.

For 83 ammeter assemblies (49-2030):
Companies sharing—California Electronics Supply, Inc., Los Angeles, on a bid of $110.40, and Weston Electrical Instrument Corp., Newark, N. J., on a bid of $5856.26.

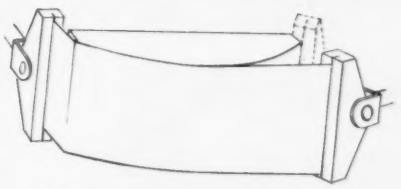
For fuses (49-2033):
Companies sharing—General Electric Supply Corp., Dayton, on a bid of $2288.45, and Electrical Products Sales Corp., Hoboken, N. J., on a bid of $4250.95.

For 4600 cable assemblies (49-2036):
Mines Equipment Co., St. Louis, on a bid of $44,364.

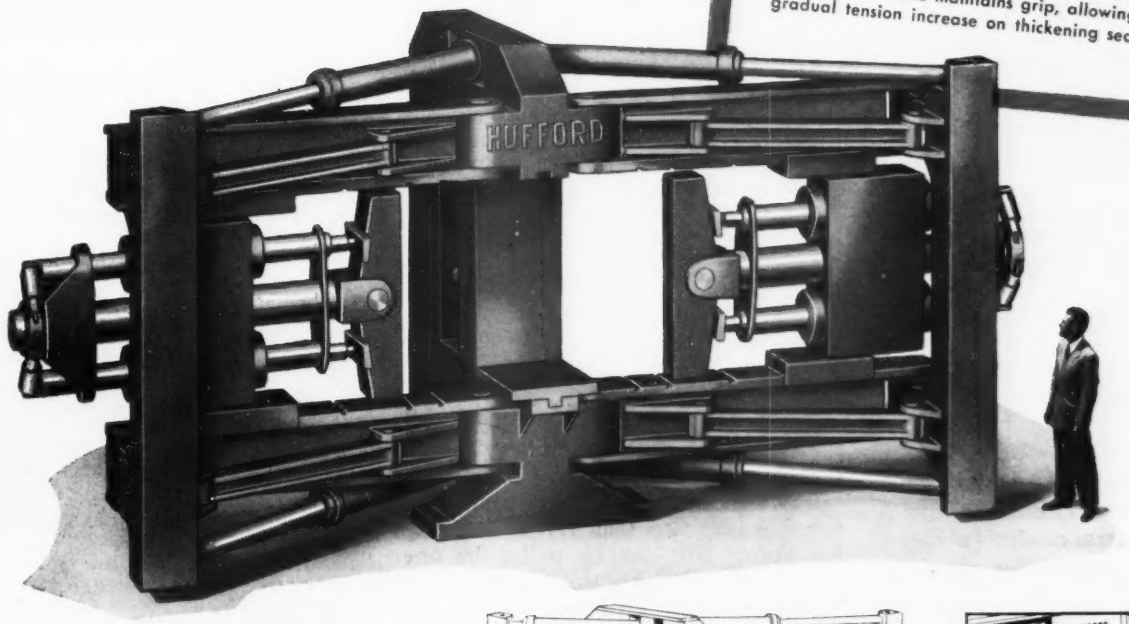
For paint & thinner (49-2041):
Companies sharing—Glidden Co., Cleveland, on a bid of $14,644.56; Hoboken White Lead & Color Wks. Inc., Hoboken, N. J., on a bid of $47,261.14; Thomas C. Mee Co., Pawtucket, R. I., on a bid of $687.50; Leon Finch, Ltd., Los Angeles, on a bid of $408; Sherwin-Williams Co., Cleveland, on a bid of $1380, and Metallic Coatings Corp., New York, on a bid of $91,346.64.

HUFFORD'S
Newest-Most Versatile
Stretch-Wrap-Forming Machine

Exclusive Feature!
FORMING TAPERED SKINS & EXTRUSIONS



Hufford is the only machine offering possibilities of forming tapered material. Because arms swing independently, the thin section can be formed first. As heavy section starts to wrap, material progressively work-hardens across the surface. Constantly increasing contact between workpiece and die maintains grip, allowing for gradual tension increase on thickening section.



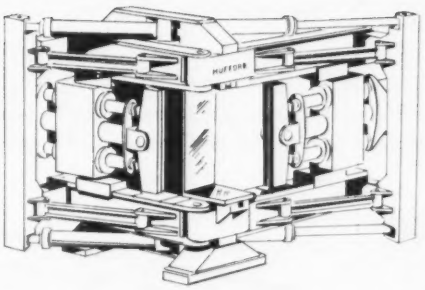
Handles both straight and tapered sheet stock and extrusions

THE UNIQUE Hufford principle of stretch-wrap-forming plus the many features of this new Hufford machine* provide exclusive forming advantages to aircraft manufacturers. Model 46 (illustrated) efficiently handles both plain and tapered skins and extrusions, forming parts uniformly to specific contour without springback.

Accuracy of parts is so exact that form dies are used as check-tooling. Low die costs and high production rates insure cheapest cost-per-piece. Because of rapid production rate, equipment is quickly amortized.

For Faster Production, for Maximum Uniformity of Parts, for Lowest Overall Manufacturing Costs, INVESTIGATE THE VARIOUS HUFFORD MACHINES with exclusive STRETCH-WRAP-FORM Principle.

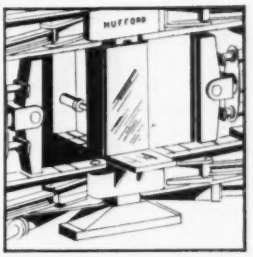
**Model 50 —50 ton capacity. Maximum work length 144", width 42".*
Model 46—150 ton capacity. Maximum work length 144", width 66".
Model 44—200 ton capacity. Maximum work length 288", width 72".
Model 60—350 ton capacity. Maximum work length 288", width 72".



Each arm moves independently, allowing greater diversity of application.

INDEPENDENT ARM MOVEMENT actuated by twin cylinders on each arm, powered by individual hydraulic pumping units, allows wider range of application.

RAPID ARM TRAVERSE. Speed of forming movement is limited only by characteristics of material itself, greatly reducing floor to floor time. Output is as much as 300% greater than other forming methods.



Bolster Plate is hydraulically extended and retracted for greater loading convenience.

EASIER DIE LOADING. Die bolster plate is extended and retracted hydraulically for maximum die loading convenience.

POSITIVE JAW GRIP, QUICK RELEASE. Jaw design insures positive grip, instant release with minimum stock wastage. Jaw is free to rotate and oscillate allowing material to follow die contours easily, equalizing the stretch.

Hufford MACHINE WORKS, INC.
207 NORTH BROADWAY
REDONDO BEACH, CALIFORNIA

Manufacturers of HYDRAULIC STRETCH FORMING EQUIPMENT • PORTABLE HYDRAULIC ELEVATORS • STRETCH LEVELING TABLES • HYDRAULIC TILE PRESSES • CUSTOM MACHINE TOOLS • SPECIAL HYDRAULIC APPLICATIONS

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DYNAFOCALS

Greater Safety
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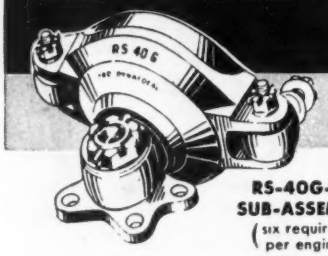
Added Comfort



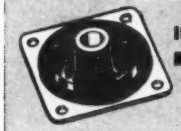
RS-40G-SA
SUB-ASSEMBLY
(six required per engine)

For LOCKHEED "CONSTELLATION"
DOUGLAS AD-1 & AD-2
MARTIN "MARS" (JRM-1)
Using Wright R-3350-C18BB and C18BD engines

Lord Dynafocal engine mountings have kept pace with changes in engine design, to provide suspension systems which combine every possible safety feature with relaxed comfort for passengers and crew Scientific design and accurate stress analysis achieve minimum weight for required strength.

Write for a copy of Lord Service Bulletin containing valuable information on maintenance problems, suggestions for increased service life, and parts list. Mention engine or mounting in which you are interested.

COWL MOUNTS



INSTRUMENT PANELS, RADIO, NAVIGATION, COMMUNICATION EQUIPMENT

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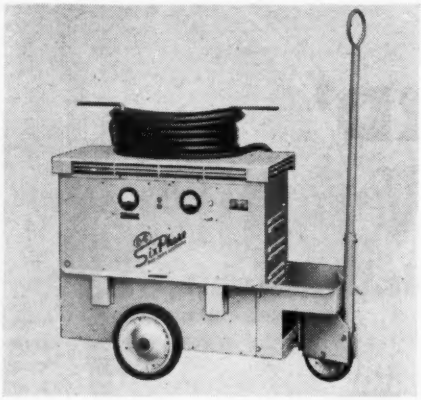
LORD
Vibration Control Systems

NEW AVIATION PRODUCTS



Ground Power Supply

For starting and testing jet aircraft and commercial transports, "Rectostarter" E24-500T portable power unit rectifies standard a.c. into smooth d.c. current with less than 2 percent rms. ripple voltage. Ripple frequency is 720 cps.

Made by **McColpin-Christie Corp.**, 4922 S. Figueroa St., Los Angeles, Calif., unit has continuous rating of 500 amp. at 28v. d.c. and momentary load rating of over 3000 amp. Voltage stabilizer holds drop from no load to full load, well within 10 percent. Voltage variations due to changes in rectifier load, within rated output, are within ±5 percent (less than 1.5v.).

Power unit can be pulled by one man or towed by truck. Self-locking brake prevents accidental rolling and two 50-lb. fire extinguishers can be mounted in end compartment. Device can be furnished with 50-ft. a.c. cable (shown) or with company's type CR-1 cable reel giving 500-ft. range.

Machining Aid

New type round-nose tool, Style 16T, for boring in trough by plunging and feeding both ways, is announced by **Kennametal Inc.**, Latrobe, Pa. Tool has brazed-on tip supplied in Grade K6 or K2S.

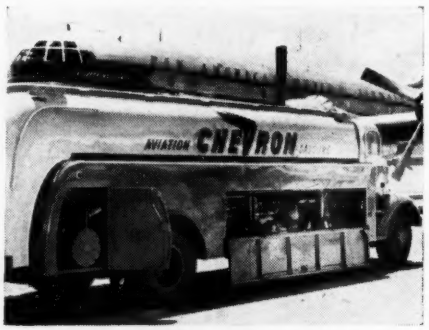
It is available in $1 \times 1\frac{1}{4} \times 12$-in. or $1 \times 1\frac{1}{2} \times 12$-in. sizes. Tip, for both sizes, has $\frac{1}{4}$-in. radius at extreme point, blending into $1\frac{1}{2}$-in. radius at each side.

Rolls Sheet Products

Silicone rubber-covered rolls, offered by **Connecticut Hard Rubber Co.**, 407 East St., New Haven 9, Conn., are designed to permit processing of many sheet-plastics, sheet-metals and fabrics at high and low temperatures, remaining soft and resilient from −100 to +500 F.

Rolls may be adapted for running sheet materials into or out of hot or cold dips, removing excess fluid or for heat sealing. Product is represented to be resistant to many chemicals and will not themselves affect chemicals or processes.

Material is claimed to have high dielectric strength, which is maintained at elevated temperatures. Static electricity reportedly does not build up on rolls as on metal covered units, and they will not carbon track from arc-overs.

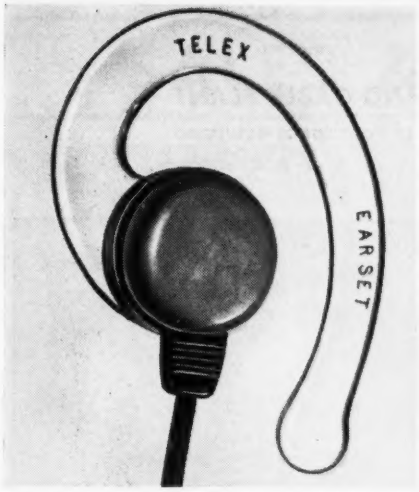


Carries More Fuel

New airport fueling truck, developed by **Standard Oil Co. of California**, 225 Bush St., San Francisco 20, Calif., is claimed to have much greater gasoline and motor oil capacity, while appearing smaller than some of its counterparts.

A cab-over-engine type, truck is GMC AF-709 Model and will carry 3300 gal. of fuel and 200 gal of oil. Gasoline is delivered at rate of 200 gal./min. to aircraft through two hoses connected to separate delivery systems utilizing duel centrifugal pumps and powered by truck engine. Separately driven gear pump and delivery system supplies oil at rate of 15-18 gal./min. Equipment protects against water entering plane tanks, and filters keep out particles larger than 10 microns.

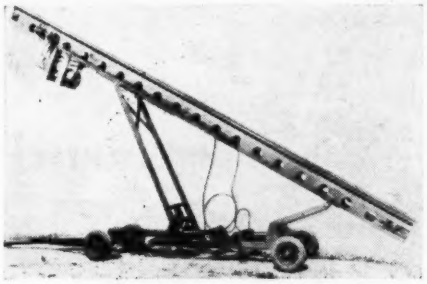
To facilitate maneuvering around large craft, truck is confined to two axles, and steering is hydraulically powered. Additional feature is lightweight, extendable, metal ladders for attachment to wing leading edge of large plane. Ladders are stowed inside compartment.



One-Ear Headset

"Earset" single-phone headset weighing only ½ oz., offered by **Telex, Inc.**, Telex Park, Minneapolis, Minn., has plastic frame which slips onto one ear to hold receiver in place. Other ear is free for normal conversation.

Device is represented to fit either side of head so snugly that it can not fall off. It has single cord equipped with standard phone-plug connection. Volume control is optional. Unit is claimed to be suitable for technicians, radiomen and aviation headset use.



Cargo Aid

For cargo loading, portable "Tote-All" conveyors, now available with hydraulically controlled belt and hydraulic "Duo-lift" frame, is designed for quick-handling of wide variety of materials. Made by **Lake Shore Engineering Co.**, Iron Mountain, Mich., device's hydraulic system permits belt reversing and speeds up to 400 ft./min. System is powered with electric motor or gasoline engine. Frame, which is mounted on four wheels with 4.00 x 8 pneumatic tires, permits adjusting conveyor height at low end from 20 to 48 in., and at high end, from 4 to 15 ft. depending upon conveyor length. Frame is equipped with a tow bar and unit may be pulled by hand or vehicle. Conveyors are available in lengths from 10 ft. up, in multiples of 2 ft., with belt widths of 8, 10 and 16 in. Special lengths and widths are made to order.

MARMAN COUPLINGS are specified on Whittaker's outstanding new hot air valve. Whittaker engineers were impressed by the many advantages these couplings have over a standard bolted joint. The ventilated type used for this application can be installed or removed in seconds. It withstands temperatures up to 1600°, is quite light, yet provides a highly positive seal.

The Marman line includes couplings for various types of joints — straps for supporting tanks and accessories — band clamps for all kinds of hose and flexible bellows.

You will save design and production time and cost by designing Marman's standard types right into your product in the same manner that you would specify a standard nut or bolt. The versatility of the Marman line eliminates the need for an individually designed part even where the application is highly specialized.

FOR INFORMATION WRITE DEPT. W-7

MARMAN PRODUCTS CO. INC.
940 WEST FLORENCE AVENUE
INGLEWOOD, CALIFORNIA

AUTO-LITE MEANS PRECISION MANUFACTURING

OPEN SOON . . . NEW AUTO-LITE WIRE AND CABLE PLANT
at Hazleton, Pennsylvania. Over 180,000 square feet of floor space equipped with the most modern facilities for the production of wire and cable.

AUTO-LITE *announces...*

INCREASED PRODUCTION...Aircraft Wire & Cable

Aircraft engineers! Designers! Executives! The tremendous output of this new Hazleton plant, combined with the new increased facilities at the Auto-Lite Port Huron plant, makes it possible to accept additional aircraft wire and cable business. The quality of these outstanding products is the result of 38 years of experience, research and advanced laboratory tests. The specifying of Auto-Lite wire and cable is fast becoming standard practice among leading aircraft manufacturers who have found that money cannot buy better wire and cable. For an informative catalog, write to

THE ELECTRIC AUTO-LITE COMPANY
Wire and Cable Division
Port Huron Michigan

LOW TENSION

Aircraft cable with copper conductor
Specification AN-JC-48a

Aircraft cable with aluminum conductor
Specification ANC-161

Shielded aircraft cable
Specification ANC-168

HIGH TENSION

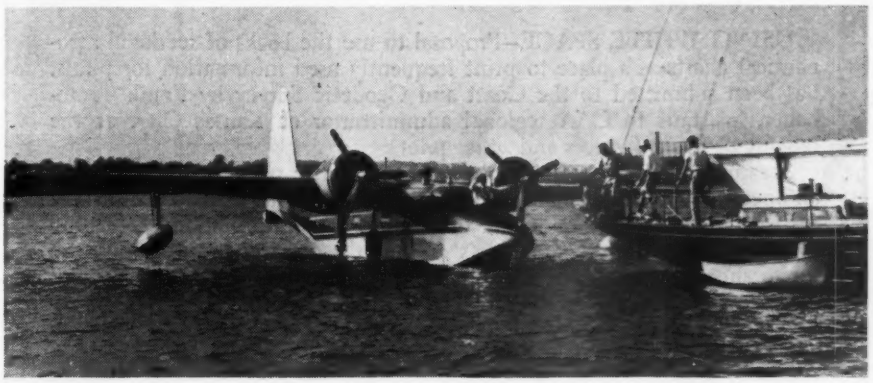
Aircraft ignition cable with stainless steel conductor and neoprene sheath
Specification ANC-130a, 5mm, 7mm and 9mm sizes

Aircraft ignition cable—Auto-Lite Steelductor—with stainless steel conductor and braid and lacquer finish
Specification AN-JC-56

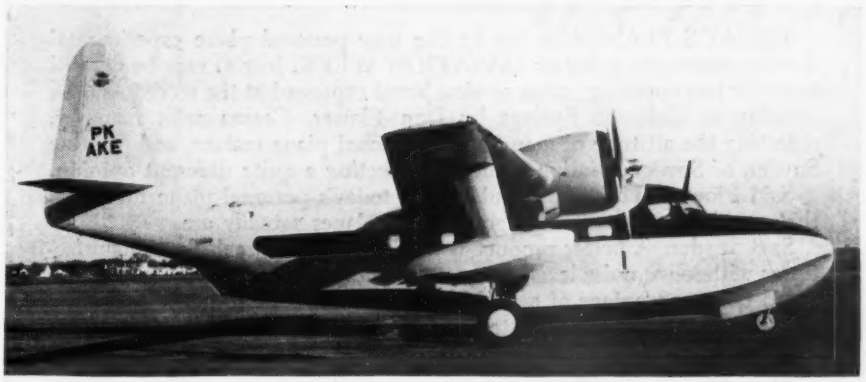
Aircraft ignition cable with copper conductor and braid and lacquer finish
Specification AMS-3390 and AMS-3392

Aircraft ignition cable with copper conductor and neoprene sheath to commercial specification

Aircraft ignition cable with copper conductor and braid and lacquer finish to commercial specification



FULLER BRUSH CO. uses Mallard as tender for Fuller brothers' yacht, while . . .



. . . ASIATIC PETROLEUM CO., Batavia, has this and two others for executive travel.

Business Use of Mallard Climbs

Plush ten-place Grumman amphibian is number two postwar executive craft; owners utilize factory service.

With approximately 50 Grumman Mallards now serving business and private owners this luxury ten-seater has quietly climbed into the number two position (discounting surplus types) in the multi-engine executive plane category. And in contrast to its rival, the twin-Beech, the Mallard has been in the public eye less than three years.

Mallards have been putting in a maximum of about 600 flight-hours yearly. Their utility is roughly broken down into: one-third used extensively on-and-off water, another third see 50 percent water usage, and the rest operated almost exclusively from land.

▶ **Not A Work-Horse**—Although the Mallard's roster of owners includes many famous concerns, and it has handled some rough assignments, it cannot be considered a work-horse in the accepted sense. For the most part it is engaged in ferrying top executives in plush syle on long trips throughout the Northern and Southern Hemispheres and abroad.

Seven owners have flown their amphibians to Europe without modification to the aircraft. Private owners, like William E. Boeing, Vincent Astor, and Frank W. Fuller, Jr., annually make extensive vacation jaunts of thousands of miles, including much overwater flying.

Boeing reportedly uses his Mallard as a tender for his yacht; while Astor lends his craft to his pilot for charter when it is not otherwise needed. King Farouk of Egypt is scheduled to take delivery of two specially-fitted Mallards in August to expedite his traveling.

▶ **Uses**—Major industries find uses such as these for their Grummans:

• **The Texas Co.**, with two Mallards, bases a plane in Louisiana for visiting underwater oil drilling operations in the Gulf.

• **Hydro-Electric Power** Commission of Ontario surveys power locations and dam sites in the interior from the air.

• **Superior Oil** (two Mallards), has used the craft for establishing airstrips along the Nile, the planes dropping off technicians and supplies.

On the more rugged side, the craft have seen this service:

• **Hudson Bay Mining & Smelting Co.**, transported supplies to its mines at 50-below temperatures, landing on ice.

• **Twentieth Century-Fox** has been spotting film locations from the air; gave the Mallard a supporting role in one of its new films. Some of the scenes involved flying in turbulent weather for authentic shots.

• **The N. Y. Daily News** Grumman has figured in a number of news-beats for the paper, most noteworthy being during the 1947 Florida hurricane. Flying from N. Y., News photographers and reporters scooped all news agencies on complete coverage by following along in the trail of the disaster. Wirephoto equipment carried in the plane permitted transmission of the on-the-spot photos almost immediately. Although the Mallard has not been used heavily, the paper feels it earns its keep by making possible such coverage.

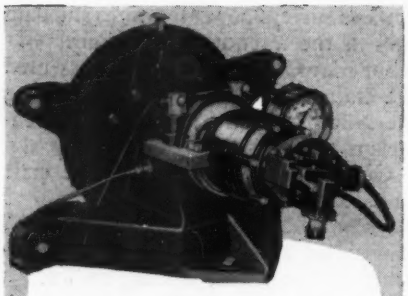
▶ **Factory Servicing**—Mallard sales are handled directly through the factory at Bethpage, N. Y., and as a result nearly all the owners return their planes for checks and overhauls. Some of the amphibians have put in 800 hours before coming in for a major checkup; Superior Oil flew a Mallard in from Egypt with 750 hours on it.

Grumman says that it can completely tear the airplane down and have it in the air three-four weeks later.

Four months ago the company shifted Mallard production from Plant 2 to Plant 1 because the space was needed for output of the much larger JR2F-1 Albatross air-sea rescue amphibian for the Navy. Sales volume of the Mallard is at the point where one-and-a-half to two of the craft are being turned out per month, although the basic price (with radio) has gone from $115,000 to $150,000. The highest priced Mallards sold thus far were three to Asiatic Petroleum Co., in Batavia, for $160,000 apiece, because of extra radio equipment.

Field for Lease

The Milwaukee county board has voted to advertise for bids to operate the Curtiss-Wright Airport. The field had been operated by Flightways, Inc., since the county purchased it from that firm two years ago, but the airport has been closed to flying since last fall while the county enlarged and improved it. It is expected to be ready for reopening by late summer.



QUICKER STARTS, GREATER STARTER DEPENDABILITY

WITH GREER STARTER TESTER

Many a flight has been long delayed, many a mission failed to materialize because an engine starter failed to turn the engine over at the critical moment.

To overcome these costly delays and failures the combined efforts of Jack and Heintz and Greer Hydraulics were used to design and manufacture the low cost, universal Starter Tester shown above. This unit offers complete facilities to test all Aircraft Starters Types I, II, III, and IV with either 6 or 7 inch pads including Packard Merlin Starters and Jack & Heintz Retraction Motors.

Ever on the alert for new requirements of the aviation industry, Greer Hydraulics is proud to add this tester to its long list of aircraft maintenance and test machines which it offers to the aviation industry.

Greer Hydraulics is the sole manufacturer of a complete line of maintenance and test machines. Write or call today for additional information stating your maintenance problem.

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HYDRAULICS INC.

454 EIGHTEENTH ST., BROOKLYN 15, N. Y.

BRIEFING FOR DEALERS & DISTRIBUTORS

USING WHITE SPACE—Proposal to use the backs of sectional aeronautical charts as a place to print frequently used information for pilots, has been submitted to the Coast and Geodetic Survey by Frank Trumbauer, assistant to CAA regional administrator at Kansas City, at the request of flying farmers and other pilots.

A sample chart uses the heretofore blank white space on the back for: an operational altitude chart with information showing how to use it, data on search and rescue, a digest of useful radio information, procedure for flight in a control zone, do's and don'ts for mountain flying, and tables showing ground distress signals, ground hand signals, cruising altitudes outside control areas, light gun signals and visual flight rule minimums. Assuming that the proposal is virile enough to withstand the apathetic reception which too frequently greets a new idea in government circles, it promises to be an inexpensive and worthwhile means of making this information readily available to the pilot when he needs it most.

TODAY'S PLANES—A key to the new personal plane experimental developments now going on (AVIATION WEEK, July 4) may be derived from the two opposing points of view heard expressed at the recent ADMA meeting at Colorado Springs by Don Flower, Cessna sales manager, reflecting the attitude of many major personal plane makers, and Vy Ray Snyder, of Snyder Aviation, Chicago, reflecting a quite different opinion.

Said Flower: The main trouble with today's personal plane market is that people don't know how good the airplanes actually are.

Said Snyder: A better product is needed from personal plane manufacturers with lower noise level, adequate room and comfort, reduced landing speed taking advantage of available NACA information on wing flap and slot designs; and more adequate financing should be arranged for distributors and dealers.

BIGGER PARTS BUSINESS—An analysis of aircraft dealer revenues which has been prepared by Bob Kenty of Air Associates and Dallas, shows the following breakdown for 1946 and 1947: flight operations, 40 percent; aircraft sales, 25 percent; repairs and parts, 20 percent; gas, oil and storage, 15 percent. Repairs and parts have been badly neglected by many fixed base operators, Kenty says, and could well bring in a much larger revenue if properly merchandised.

Too frequently, Kently says, the dealer keeps a stock of parts and accessories to maintain his own equipment, without enough thought to having adequate parts replacements and accessories which he can merchandise aggressively to private owners who use his field. If flight operations and aircraft sales continue in their present state of doldrums the repair and parts business "may be the operators' only salvation," Kenty believes.

ROADABLE ERCOUPE RIDES AGAIN—The experimental roadable Ercoupe which folds its wings above its fuselage and taxis down the highway had a 100-mile road test from Jacksonville to Daytona Beach recently, in the Montreal-Miami Women's Air Race. The roadable developed by Wismer Holland, Valdosta, Ga., from a conventional 1946 Ercoupe, was piloted by Ellen Gilmour and Gladys Pennington of Miami who flew it from Montreal, landed at Jacksonville in the evening, then took to the highway. Despite wind and rain, they made the trip to Daytona without serious incident, but had to stop there when the battery went dead. Investigation indicated that the headlights had exhausted the battery, which was not recharged while driving because the engine turned over too slowly. The Holland conversion, as previously described and pictured in AVIATION WEEK, has a collapsible screen around the propeller which remains in place for road travel. The women took off from Daytona next morning arriving in time to finish fifth in a field of six.

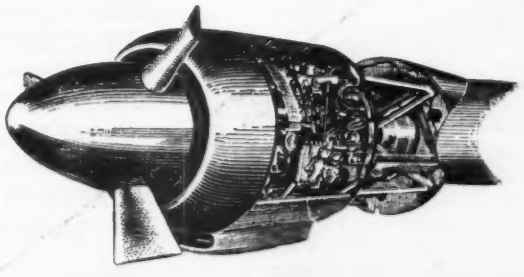
—ALEXANDER McSURELY

No 8

Mamba memoranda

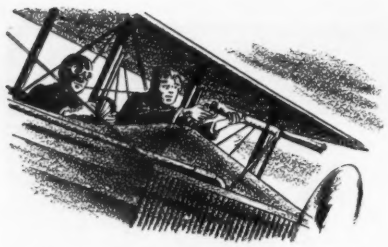
COMPACTNESS AND COMPLETENESS

Despite the small diameter of the Mamba (under 30" cowled) all the aircraft and engine accessories are housed in the nacelle. The oil system too, complete with oil tanks, is incorporated and no external cooling is necessary. The Mamba is a completely self-contained power unit.

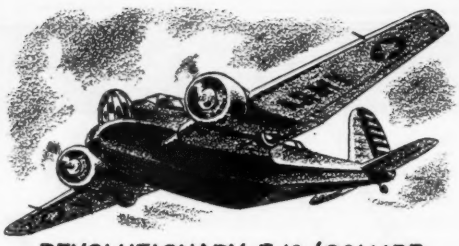


ARMSTRONG SIDDELEY MOTORS LIMITED
Parkside, Coventry

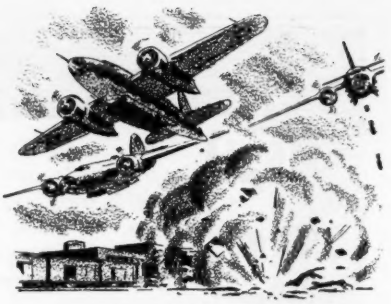
Branch of the Hawker Siddeley Group



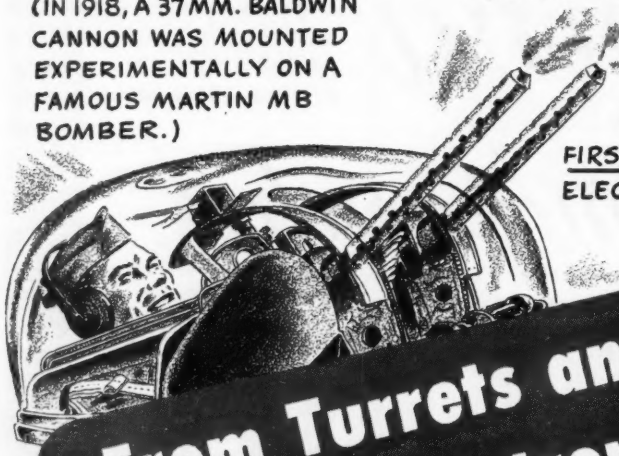
THIS WINCHESTER-ARMED 1913 PURSUIT PLANE WAS ANOTHER MARTIN FIRST! (IN 1918, A 37MM. BALDWIN CANNON WAS MOUNTED EXPERIMENTALLY ON A FAMOUS MARTIN MB BOMBER.)



REVOLUTIONARY B-10 (COLLIER TROPHY) BOMBERS FEATURED THE FIRST ENCLOSED TURRET, A MARTIN DEVELOPMENT.



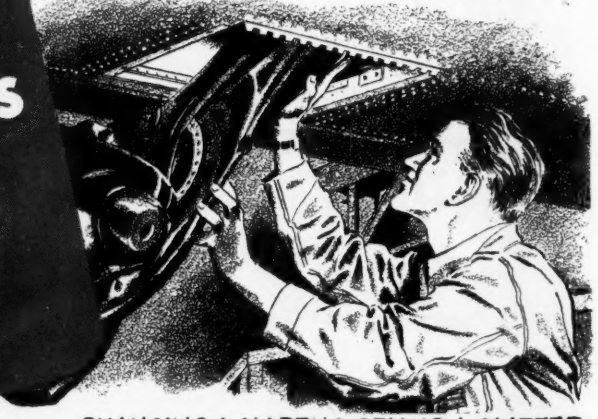
DURING WORLD WAR II, MARTIN WAS THE LARGEST BUILDER OF ELECTRICALLY-OPERATED GUN TURRETS.



IN 1936, MARTIN PRODUCED AMERICA'S FIRST POWER-OPERATED TURRET. **TODAY,** MARTIN ELECTRONIC FIRE CONTROL SYSTEMS MAINTAIN THIS HISTORIC LEADERSHIP. ELECTRONIC "BRAINS AND MUSCLES" TO LOCATE, TRACK AND FIRE AGAINST ENEMY AIRCRAFT.

From Turrets and Tanks to Electronics and Elastomerics

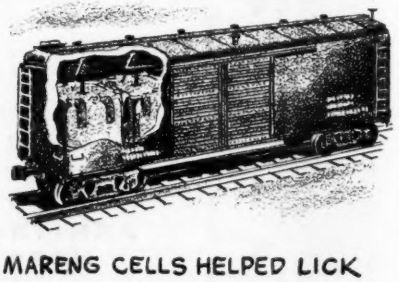
Pioneering by Martin paid off here, too!



CHANGING A MARENG CELL IS A MATTER OF ONLY A FEW MINUTES' WORK--A VITAL FACTOR IN COMMERCIAL AIRLINE ECONOMY.

AS LONG AGO AS 1918, MARTIN EXPERIMENTED WITH BULLET-PROOF FUEL TANKS ON THE MB-2.

THEIR SELF-SEALING FEATURE SAVED THE LIVES OF THOUSANDS OF AMERICAN AIRMEN AND HUNDREDS OF PLANES DURING WORLD WAR II



MARENG CELLS HELPED LICK TANK CAR SHORTAGE DURING EARLY MONTHS OF WORLD WAR II BY CARRYING GAS IN BOX CARS.

AMAZING MARTIN MARENG CELLS WERE DEVELOPED AS GAS TANKS IN THE LATE '30s TO FIT PLANE WINGS LIKE FOOTBALL BLADDERS.

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THE GLENN L. MARTIN COMPANY, BALTIMORE 3, MD.

CAB Backs Standard Cockpits

Board circulates revisions covering future transport designs. Foresees big economies, increased safety.

After years of talk and little action, plans for standardizing transport aircraft cockpits seem to be making real progress.

Early this month the Civil Aeronautics Board issued a proposed regulation which would standardize cockpit arrangements of all transport category aircraft on the drawing boards at the time the new rules are adopted. More important, the agency also invited comment on the extent to which the standardized cockpit should be made applicable to existing aircraft.

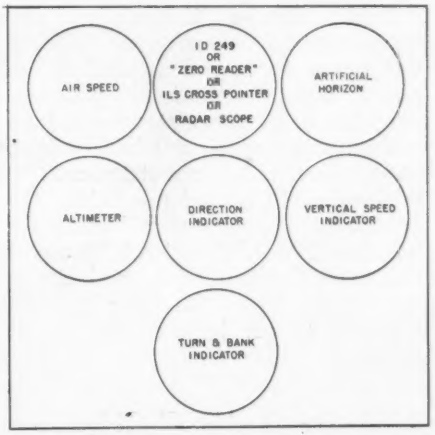
"Application of cockpit standardization rules to existing aircraft is a crucial question," CAB asserted, "since the planes which dominate the civil aviation scene for the next five years or more are already in operation."

▶ **Armed Services Act**—Cockpit standardization has been given considerable attention by various aviation groups, but until the recent armed services agreement on a standardized cockpit all such proposals have encountered sufficient resistance to kill them before they could receive serious consideration by civilian agencies. CAB said that since the armed services (the largest purchaser of aircraft in the U. S.) had agreed on cockpit standardization, "it appears to be an appropriate time to propose the same move for all other purchasers of equipment."

Variations in cockpit arrangements increase the cost of aircraft to the airlines and render more difficult the integration of commercial transports into the military program during a national emergency. The proposed new regulation for the airlines follows the military standardized cockpit layout as closely as possible.

▶ **Safety Problem**—CAB noted that cockpit standardization will help resolve the safety problems involved in the increasing number of equipment interchange arrangements proposed by the airlines. Air Line Pilots Assn. president David L. Behncke has announced his union's opposition to equipment interchanges "because variables in instrumentation and controls within the cockpit make interchanges hazardous" (AVIATION WEEK, June 13).

Estimates of how much money cockpit standardization on presently-operating aircraft would cost U. S. domestic and international airlines vary widely.



ARRANGEMENT of instrument flight panel proposed by CAB. Instrument centerline is to be within two inches of centerline of pilot's vision.

Figures ranging between $4 million and $15 million are mentioned. Cost of the program depends on whether the standardization finally adopted covers only the main instruments and controls or goes down to the last knob and switch.

▶ **ATA View**—The Air Transport Assn. has recently shown growing interest in cockpit standardization. A survey of ATA members during May indicated that they favored establishment of a project within the Society of Automotive Engineers aimed toward development of a manual of recommended practices on cockpit layout for transport-type aircraft.

Some industry quarters feel that standardization now will hamper efforts to further simplify cockpit layouts. Development of new instruments for use in jet transports and in the all-weather airways program will complicate cockpit standardization.

The proposed cockpit layout rules are in the form of amendments to Parts 3 and 4b of the Civil Air Regulations. If the amendments are adopted, all new airplanes for which type certificate applications are subsequently filed under Parts 3 and 4b would have to comply with the cockpit standardization regulation.

▶ **Training Devices Eyed** — Synthetic training devices also would be expected to conform to the standardized cockpit.

While CAB believes some cockpit standardization requirements should be made applicable to existing transport aircraft, it concedes there is still some question as to the degree of standardization desirable and the date by which compliance with the regulation should be required.

Interested parties have been given 60 days to submit written comments to CAB on the proposed new cockpit layout rules. These comments will be considered by the Board before further action is taken on the regulation.

The new rules are:

1. Location of Controls—(a) All controls shall be so located as to permit their use within the normal reach of a pilot when seated with harness locked.

(b) All controls of a like function shall be grouped together.

2. Actuation of Controls—(a) All controls shall be so designed that the actuation thereof forward, upward, or clockwise shall result in increased performance of the component or the aircraft.

(b) All controls shall be so designed that the actuation thereof aft, downward or counter clockwise shall decrease the performance of the component or the aircraft.

(c) All controls of a variable nature induced by a rotary motion shall move clockwise from the off position, through low or dim, to high or bright.

3. Power Control (Throttles) — (a) The power control or composite (single) power control unit, when used, shall be on the left-hand side of the cockpit, except in dual control (side-by-side) aircraft where a pedestal, outboard or center instrument panel mounting is utilized. A brake lock or irreversible lock mechanism shall be incorporated on all power controls.

(b) Power controls shall be actuated forward to increase forward thrust. Where reverse pitch propellers are used, the reverse pitch control motion shall be rearward to give rearward thrust. If the normal throttle control is used as a reverse thrust control a radial or lateral detent shall be provided between power off and application of reverse thrust pitch. The motion of the friction lock or irreversible lock mechanism shall be forward or clockwise to tighten.

4. Water Injection Control — (a) The water injection control shall be incorporated in the power control. It shall be actuated by a switch operated in the forward end of travel of the power control lever. A master on-off switch for the water injection pump shall be located on or adjacent to the power quadrant.

(b) The water injection control shall be actuated by the passing of the master power control through a detent or gate in the increased thrust direction.

5. Water Quantity—The water quantity and water injection system warning indicator shall be located adjacent to the water injection master switch.

6. RPM Control — (a) Where an RPM control is required it shall be placed on the right of and shorter than the power control lever. Where an RPM control is replaced by a composite (single) power control unit such control lever shall be placed as provided in paragraph 3 above.

(b) An RPM control shall be actuated forward for increased RPM.

7. Mixture Control—(a) The mixture con-

trol shall be located to the right of and shorter than the RPM control. Where a mixture control is replaced by a composite (single) power control unit, it shall be placed as provided in paragraph 3 above.

(b) Where a composite power control unit is used the idle cut-off condition shall be separated from the operating settings by a safety guard which may be overridden only by deliberate movement of the control. The control shall be so designed that a forward movement thereof shall provide increasingly rich conditions. The maximum rich conditions shall be obtained by a full forward movement thereof. Any intermediate position which automatically provides a present carburetor condition will be so indexed as to provide both sensory and visual identification of the position.

8. **Superchargers** – (a) The supercharger control shall be located to the left and below the throttle control or on the aft side of the pedestal. Where a springload mechanism in the supercharger control is used to permit such control to automatically snap into forward low position when released from high position, a positive notch for securing the control lever in the take-off position is required.

(b) Actuation motion of the supercharger control shall be upward or forward for take-off. No locking device provided to secure the power control, RPM control, or mixture control shall be applied to the supercharger control.

Control Knob Shapes–Sections 9 through 14 of the proposal specify knob shapes to be used for supercharger, power, RPM, mixture, landing gear and landing flap control. Section 15 designates the flight instrument panel arrangement.

Puerto Rican Official Hits Strato-Freight

(*McGraw-Hill World News*)

SAN JUAN–In a report covering Strato-Freight's C-46 crash in which 53 were killed, District Attorney Jose C. Aponte charged that the airline, West Indies Aviation Service, and Capitol Travel Agency were specifically responsible for the disaster. He asked the Civil Aeronautics Board to revoke licenses of chief pilot Wakefield and mechanic Carlos Perez.

The report also recommends that those involved be charged with "involuntary homicide." Aponte's findings have been submitted to Gov. Munoz Marin, who will present them to federal authorities during his Washington visit.

The report made the following accusations:

• **Strato-Freight's C-46** carried insufficient life-rafts; chief pilot Wakefield operated the aircraft overloaded and accepted a false and fraudulent manifest; this C-46 previously had flown from Newark to Miami to Puerto Rico with defective flaps, "which indicated that the aircraft was not in appropriate condition to make the flight."

• **West Indies Aviation Service** mechanic Carlos Perez in changing defective spark plugs put in plugs not approved for C-46. As a result many plugs burned out on take-off. It is recommended that the company be barred from Isla Grande Airport until it is certificated to handle maintenance and repair.

• **Manager of Capitol Travel Agency** was not authorized to sell airplane flight tickets. The Public Service Commission was asked to refuse the agency a license.

Public Service Commission and Transportation Authority was asked in the report to amend regulations on ticket agent obligations, passenger weighing, to get sworn statements from plane captains on aircraft basic weight, and verification of sworn statements.

▶ **Non-sked Near-crack-up**–While the Strato-Freight case was still being debated, a C-46 of Associated Transport Co. with 62 aboard developed engine trouble after takeoff from San Juan but managed to get back to the airport safely.

Unions Join Calif. Carrier Battle

The tooth-and-claw fight between certificated and uncertificated carriers on the West Coast has involved new protagonists.

Six labor unions representing ground and flight personnel of the regular airlines operating in California have joined with management in alleging that cut-rate intrastate carriers are permitted to fly with inadequate safety standards. Civil Aeronautics Board and CAA officials retort that many of the charges leveled against the cut-raters are without foundation.

Western Air Lines president T. C. Drinkwater opened the attack on the independents early this month (Aviation Week, July 11). The cudgel has been taken up by the Air Line Pilots Assn., the United Automobile, Aircraft and Agricultural Implement Workers of America-CIO, the Air Line Stewardesses Assn., the Airline Communications Employees Assn.-CIO, the Air Line Dispatchers Assn.-AFL, and the Airlines Division of the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees.

▶ **Protest to Washington**–In telegrams to the Civil Aeronautics Board and members of Congress, the unions demanded that California cut-rate operators be placed under the same economic and safety regulations as the certificated airlines. "Safety regulations governing the operations of the 'cut-rates' and the regularly established certificated airlines are so far apart as to be almost incomparable," the unions declared.

The unions' outburst followed Drinkwater's warning to his employes that the five or six intrastate lines operating in California with transport-type equipment present a serious threat to union wages and working conditions. Independents on the Los Angeles- San Francisco run are charging fares of $9.95 and $9.99, compared with $20 and $21 for their certificated competitors.

Efforts by the certificated carriers to have the California legislature and state public utilities commission regulate the intrastate carriers' operations more severely met with little success. The appeal to the federal government followed.

▶ **Charges Repeated** – The unions echoed many of the charges which Drinkwater leveled at the independents. They said that the cut-rate operators' standards are below those of the certificated lines from the standpoint of maintenance, dispatching, communications, and pilot qualification.

Why, the unions asked CAB, should the cut-rate carriers be allowed to fly the Los Angeles-San Francisco federal airways according to one set of rules while the regular airlines must follow much more strict safety regulations while flying the same route? "Sooner or later," the protest declared, "all companies engaged in scheduled transportation of passengers over the federal airways will be obliged to observe the same safety and economic rules."

Many of the implications made by the unions against California's cut-rate intrastate carriers cannot be supported, CAA and CAB officials told Aviation Week.

For example, one of the questions asked by the unions was: Why are these cut-rate lines allowed to operate a multi-engined passenger plane under limited regulations similar to those governing a light private plane?

Answer is that the California independents are not permitted to fly their transports under regulations similar to those covering a lightplane.

The unions also asked: Why, when regular airline pilots are limited to 85 hr. of flying a month, does CAB place no restrictions whatever on the pilots of the cut-rate carriers? Why aren't the independents required to carry a reserve supply of fuel on every flight?

▶ **Federal Agencies Reply**–CAA and CAB officials told Aviation Week that the California and other intrastate lines must now obey the 85-hr. flight time limit and carry adequate fuel reserves on all flights. In fact, the pilot flight time limit governing scheduled intrastate carriers and interstate non-scheduled lines is in some respects more exacting than the comparable regulation for certificated operators.

America Wants Value . . . America Buys

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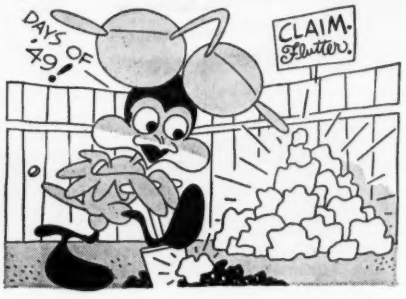

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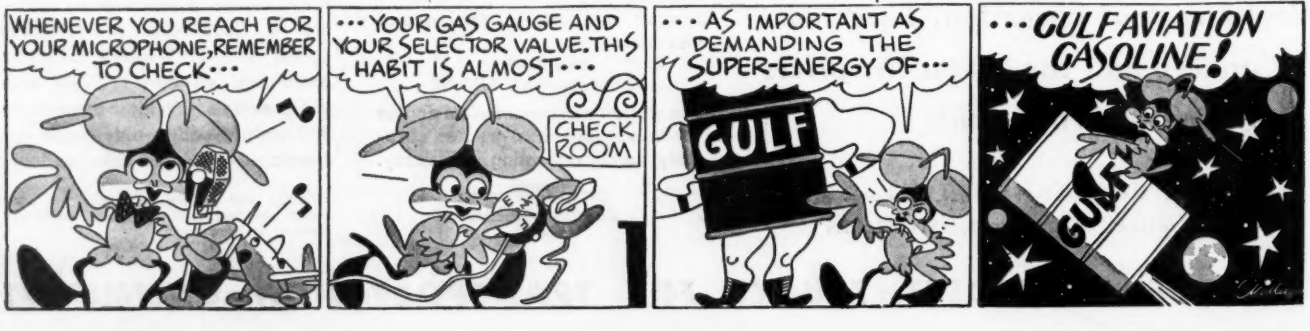
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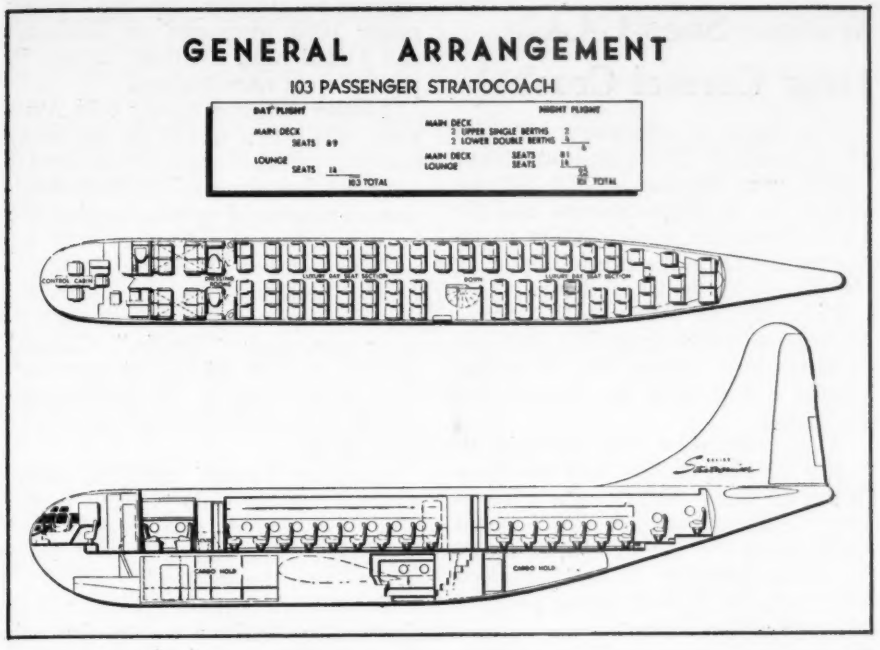

'Stratocoach' Spurs Skycoach Study

Boeing proposes 103-seat Stratocruiser as other signs reflect interest in lower air travel fares.

By Stanley L. Colbert

Plans for a domestic and international Super-Skycoach carrier now center around Boeing Airplane Co.'s proposed 103-passenger "Stratocoach" version of its $1.5 million Stratocruiser, although other craft may be in the running.

Airlines, the Civil Aeronautics Board, Department of Commerce and International Air Transport Assn. have taken different views on the air coach question. But Boeing, taking no sides, has come up with a modified Stratocruiser carrying either 99 or 103 passengers. At current operating costs, according to the company, it could:

• **Show a $2306 profit** on roundtrip transcontinental runs, operating with a 60 percent passenger load factor and 50 percent cargo factor. This would be an increase of $924 per roundtrip flight over profit the company claims could be made if regular 75-passenger Stratocruisers are used.

• **Show a roundtrip** trans-Atlantic profit of $18,939, operating with a 65 percent passenger load factor and 70 percent cargo factor. This would be an increase of $1020 per roundtrip flight over profit possible with the regular 75-passenger Stratocruisers.

In the 99-passenger version of the Stratocoach, space is provided amidship for a galley; the 103-passenger version puts four more seats in this space.

Boeing's announcement of the plane fits in the Super-Skycoach picture along with these other developments:

• **International Air Transport Assn.,** which tabled move, pending more detailed study, to introduce tourist rates this spring, has decided to cut trans-Atlantic fares during the winter. Special rates, good only on roundtrips, will reduce fare from $630 to $466.70.

• **Northwest Airlines,** through K. R. Ferguson, vice president-operations and engineering, has hinted that its Stratocruisers may go into a domestic Skycoach operation. Said Ferguson, testifying before a Senate committee: "Our experience with coach service indicates a vast mass air transportation market existing at lower fare levels . . . Northwest may yet be the first airline to offer the much-heralded three-cent fare."

• **Department of Commerce** census shows 15 million families in the $3000-$6000 income bracket, compared with only 4 million families in the over-$6000 bracket. Herbert A. Wilkinson, chief of Commerce Dept.'s travel branch, recently told members of the New York Airlines Committee: "These are the people for the most part short on vacation time. This provides a tremendous potential for travel."

• **Airlines and travel agents** told Aviation Week that bookings for European travel next year—a Holy Year in Rome—already are coming in and should get heavier after the summer months.

• **Pan American Airways** president Juan Trippe, has said he is counting on using Stratocruisers to offer world-wide tourist class air transportation at one-third or more below regular rates.

CAB has turned thumbs down on international Skycoach service. It told American flag carriers that "tourist fares should not be instituted at this time. There are no indications at present that tourist services can be performed at substantially lower cost than regular services. . . .

"The only claims made for substantial cost reductions in tourist service contemplate the use of the Boeing Stratocruiser for which no experience cost data will be available for some time" (Aviation Week, May 9).

CAB is concerned over increased mail pay requirements, and possible diversion of regular traffic to low-fare flights.

▶ **Lockheed Plans**—The Stratocruiser isn't the only plane proposed for coach-type service. Lockheed has plans for a 90-passenger version of the Constellation Model 949, making it 18 ft. longer than the present model and increasing maximum gross to possibly 135,000 lb. The plane would be powered by Wright compound engines, giving it possibly 20 percent more range. Originally the craft was advanced as a freight carrier (Aviation Week, June 1).

American Airlines reportedly is planning a 60-passenger DC-4 and a 101-passenger DC-6.

While CAB has discouraged U. S. flag lines from offering a tourist fare to Europe, it has permitted Transocean Air Lines and Seaboard & Western Airlines—two nonscheduled carriers—to carry students abroad this summer at lower than usual rates. Youth Argosy told Aviation Week the students pay $350 for a roundtrip, considerably less than what it would cost them to travel by scheduled airline (Aviation Week, June 27). Both TAL and S&W expect to carry thousands of students under the Youth Argosy plan.

Meanwhile, a coach-type Stratocruiser is already in service. Military Air Transport Service is using a "high-density" YC-97B, utilizing double seats and alternating triple seats, to accommodate 85 passengers.

Tax Reduction

Some reduction in transportation taxes at this session of Congress appeared likely last week.

President Truman called for removal of the 3 percent transportation tax on property.

The Senate Finance Committee approved legislation reducing the 15 percent tax on persons to 10 per cent.

Several congressmen, including Sen. Pat McCarran (D., Nev.), dissatisfied with both the President's recommendation and the Senate committee's action, announced they would push for complete removal of the transportation tax on both property and persons.

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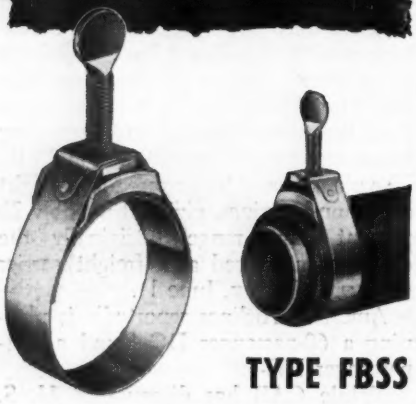

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Widow Sues CAA Over Carmel Crash

The widow of a passenger killed on United Airlines' DC-6 crash at Mount Carmel, Pa., has filed a $200,000 suit against the U. S. government and the Civil Aeronautics Administration, charging them with negligence in approving the plane for commercial flying.

Previously, the widow—Mrs. Mary E. DeVito of New York—filed suits in U. S. Eastern District Court against United Airlines and the Douglas Aircraft Co.

A spokesman for Gair & Gair, attorney for Mrs. DeVito, told AVIATION WEEK the suit against Douglas will contend the aircraft was not manufactured properly and that the fire-fighting equipment was defective. United is charged with being in control of the plane at the time of the accident.

▶ **Hearing Testimony**—Civil Aeronautics Board has not yet released a decision on the Mt. Carmel crash, but hearings last year were open to the public and transcripts of testimony presented by government lawyers and experts are available. In a case of this sort, it may be possible that testimony at the crash hearings by government witnesses will help strengthen the case against the government.

Holiday Traffic Uses All Planes

The kind of boom-time traffic the scheduled domestic airlines planned for and never got in 1947 and 1948 became a reality during late June and the Independence Day weekend. Ticket agents for nonscheduled operators also reported record sales.

Among the carriers to boast of the best business in history last month were Northwest and Capital airlines.

NWA flew 78,005 passengers on its domestic system during June. This was 3319 more than in August, 1946, the previous record month, and 9741 ahead of June, 1948.

▶ **Best in 23 Years**—Capital Airlines said it handled more traffic last month than ever before in its 23-year history. Gross revenues totaled $2.4 million, up 36.5 percent over June, 1948.

July 1 was the biggest day in the company's traffic experience. Twenty-five extra sections were necessary to handle the more than 6000 passengers starting on their holiday weekend via Capital.

▶ **Irregulars Busy**—Nonsked flights out of New York to Chicago, Miami and the West Coast over July Fourth were almost triple the usual number. One nonsked ticket agency reported booking nearly 1000 passengers on California and Miami trips. Of these, almost 50 percent were roundtrippers.

Another nonsked agency told AVIATION WEEK that it had to turn away hundreds of ticket applicants because it could not find planes to handle the business. A number of agencies combed the LaGuardia-Newark-Teterboro area for available nonsked DC-3s and DC-4s.

▶ **Extra Sections**—Passenger agents for the scheduled carriers summed up traffic in one word: "Terrific." Colonial Airlines reported adding 84 extra sections to their flights over the four-day period. Ordinarily, Colonial operates 32 flights a day.

American Airlines' unofficial count was that one day (July 1) traffic in the New York-Newark area totaled 3665 passengers. American added 67 extra sections over the weekend.

Trans-World Airlines reported adding eight extra sections to its skycoach flights to Chicago, and 35 extra sections altogether out of New York. Eastern Air Lines estimated it added 25 extra sections. Northwest added fixe extra sections, but agents reported they could have filled many more if equipment had been available.

CAB Delays

Last possibility that the Civil Aeronautics Board will reach an early and expedited decision on the proposed Pan American Airways purchase of American Overseas Airlines has faded.

The Board has denied a petition by PAA, AOA and American Airlines asking that CAB render a decision without waiting for a report by its hearing examiner. The hearings—involving six weeks of testimony—were concluded last month (AVIATION WEEK, July 4).

SHORTLINES

▶ **Air France**—Reports it has been flying to Europe with 100 percent payloads since Mar. 1. May passenger business was up 34 percent over the same month last year, and freight increased 145 percent. Reservations are being received as far ahead as next December. Company is now operating ten trans-Atlantic roundtrips weekly.

▶ **Australia**—The Commonwealth's airlines established a new overall passenger load factor record of more than 72 percent in the first three months of this year. The high loads are due to retrenchments in lightly-used services as a result of restrictions on aviation gasoline consumption.

▶ **BOAC**—Sir Miles Thomas, new chairman who succeeded Sir Harold Hartley

July 1, states that the annual company deficit is being reduced and productivity per employe is increasing encouragingly. Passenger sales in the U. S. covering trans-Atlantic travel gained $400,000 during the first five months of 1949 compared with the same period last year.

▶ **Chicago & Southern**—William T. Arthur has been named vice president-operations. He succeeds Joseph A. Young, who resigned as operations manager.

▶ **Civil Aeronautics Board**—Has extended to Aug. 15 the deadline for submitting written comment on development of rules concerning communications equipment and personnel to be required on long overwater flights.

▶ **Delta**—Paid a 25-cent dividend July 15 to stockholders of record June 30.

▶ **Iberia**—The Spanish carrier has inaugurated a new Spain-Venezuela-Puerto Rico service with DC-4 equipment.

▶ **Flying Tiger Line**—Has appointed O. D. McKenzie as head of its aircraft maintenance sales division.

▶ **KLM**—Has again inaugurated regular weekly all-cargo service between New York and Amsterdam.

▶ **South African Airways**—Has been designated as the chosen instrument for reciprocal air transport services between the Union of South Africa and the United States and between South Africa and The Netherlands. Pan American Airways and KLM are now flying into South Africa. The new SAA services are not expected to begin for some time.

▶ **TWA**—Has carried more than 8,363,000 passengers during its first 20 years of operation. Anniversary is being celebrated this month.

▶ **United**—Has increased its coast-to-coast DC-6 service to eleven roundtrips daily.

CAB SCHEDULE

July 18—Prehearing conference on CAB's investigation into disposal of Parks Air Lines' feeder routes. (Docket 3965 et al)

July 18—Hearing on renewal of Pioneer Air Lines' feeder certificate and suspension of service at points on routes of Braniff, Continental and American. (Docket 3719)

July 25—Hearing on renewal of Southwest Airways' feeder certificate and suspension of United Air Lines' service at four California points. (Docket 3718)

Aug. 1—Prehearing conference in air freight rate investigation. Postponed from July 11. (Docket 1705)

Aug. 8—Hearing on Carco Air Service's lightplane route application. (Docket 3629)

Aug. 15—Hearing on Hughes Tool Co. control of TWA. (Docket 2796)

Sept. 6—Hearing on service to Lake Tahoe. (Docket 3623)

Sept. 26—Hearing on Seaboard & Western and Transocean Air Lines applications for all-cargo certificates between the U. S., Europe and the Middle East. (Dockets 3041 and 3818)

Nov. 14—Hearing in Western-Inland mail rate case. (Docket 2870 et al)

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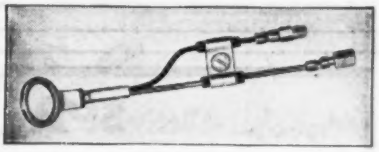

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Additional Searchlight Advertising on page 60

STRICTLY PERSONAL

THEY NEVER FLEW EASTERN AGAIN—**Bob Hotz,** our News Editor, swears this one is true. **Eddie Rickenbacker** had been plagued by a batch of customer reaction cards with the same disturbing message. He ordered each card acknowledged with a friendly letter but never received any answers. Finally, he ordered a careful check. All of the "correspondents" had died. It seems a certain EAL pilot was pretty sore at having to fly the night cargo run which frequently carried caskets. So he would steal back into the cabin, write his post cards by flashlight, and sign the names and addresses of his "passengers."

(The message on each card was: "This is the last time I will ride your airline.")

* * *

THAT DISTANT COPILOT—**Harner Selvidge,** Director of Special Products Development for Bendix Aviation Corp., says while flying around Detroit checking out some VHF gear recently he eavesdropped on the Toledo tower which was refusing landing clearance for an incoming TWA flight because an F-82 was at the end of the runway ready for take-off. The USAF ship was having radio trouble and couldn't work the tower, which was shooting green lights at him. The TWA pilot finally broke a patient silence with another appeal for clearance. The tower said no, adding rather plaintively, "I don't know why he isn't taking off." The disgruntled TWA pilot crackled back "Maybe they are arguing about who's going to fly it."

* * *

FOIBLES OF THE P.A. SYSTEM—Contributor **D. Y. Waldron,** airport manager at Dallas, writes that he heard this message blaring throughout the Dallas terminal the other morning: "Will Passenger Screwball please check with information counter, American Airlines?" Wonder how many people showed up? . . . And United Aircraft Corp.'s **Norm Clements** tells how he almost missed a plane because he thought the P.A. system's loud-speaker was saying 8:02 rather than Gate Two. Why doesn't somebody do something about mushmouth P.A. speakers?

* * *

IT'S DOUGLAS AROUND THE WORLD—According to **Dick Darrow,** Glenn Martin Co.'s PIO, his opposite number at Curtiss-Wright's Columbus plant, one **Bill Maharry,** is still arguing with the telephone company. Many months ago the unthinking utilities people put not only the CW plant, but Bill's own home as well, on a new exchange. The exchange is "Douglas."

* * *

NICKEL, NICKEL, NICKEL—Manager **B. M. Doolin** was probably humming the Pepsi-Cola song the other day as he made out his latest report to the Public Utilities Commission on the income of his San Francisco Airport. In May he took in $367.90 in lavatory receipts, a nice gain over April's $343.85, and March's $341.10. Mr. Doolin stopped long enough to make an entry in his report to the effect that the total amounts to 21,060 nickels. He is pretty optimistic about this particular concession; says it's a sure thing.

* * *

IT WAS JUST A WHISTLE STOP—Tipped off by other employes that she had two fares who couldn't speak English, Mid-Continent hostess **Betty Beazley** checked the manifest the other day in flight and talked successfully with each passenger. She decided someone had been razzing her.

While walking through the No. 2 cargo compartment with coffee for the crew she was suddenly asked "Como esta usted?", Spanish for "How are you?" Miss Beazley braced herself and wondered whether someone was shipping himself air freight. She found the voice. Two Spanish parrots were whiling away their trip to the Twin Cities. On her way back she found these parrots had acquired a well-known American custom. Both whistled at her.

R.H.W.

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J.A.N. APPROVED

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Deduct 10% from prices shown on orders of 100 or more per type

AN No.	Price Ea.	AN No.	Price Ea.
UG9/U	$ .95	UG96A/U	1.45
UG10/U	1.56	UG97/U	3.50
UG11/U	1.45	UG98/U	1.55
UG12/U	.95	UG100/U	2.34
UG13/U	1.56	UG101/U	2.95
UG14/U	1.45	UG107/U	2.25
UG15/U	.95	UG108/U	1.75
UG16/U	1.56	UG109/U	1.75
UG17/U	1.45	UG114/U	1.50
UG18/U	.99	UG115/U	1.33
UG18A/U	1.05	CW123/U	.45
UG18B/U	1.09	UG131/U	6.00
UG19/U	1.28	UG146/U	2.25
UG19A/U	1.38	CW155/U	.40
UG19B/U	1.45	UG154/U	5.35
UG20/U	1.17	UG156/U	4.25
UG20A/U	1.26	UG157/U	4.25
UG20B/U	1.41	UG160/U	1.90
UG21/U	.99	UG160A/U	1.55
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UG21B/U	1.09	UG173/U	.30
UG22/U	1.08	UG174/U	16.00
UG22A/U	1.38	UG188/U	.95
UG22B/U	1.34	MX195/U	.75
UG23/U	.99	UG197/U	5.00
UG23A/U	1.26	UG201/U	1.83
UG23B/U	1.29	UG202/U	2.75
UG27A/U	2.25	UG204/U	2.25
UG28/U	2.34	UG206/U	1.92
UG29/U	1.22	UG208/U	28.50
UG29/AU	1.56	UG212/U	4.50
UG30/U	1.75	UG213/U	4.50
UG32/U	20.00	UG215/U	3.35
UG33/U	20.00	UG216/U	8.70
UG34/U	17.50	UG217/U	3.10
UG35A/U	16.00	UG218/U	6.50
UG36/U	16.00	UG222/U	35.00
UG37/U	16.00	UG231/U	2.00
UG37A/U	16.00	UG235/U	28.50
UG57/U	.99	UG236/U	11.75
UG58/U	.65	UG241/U	2.20
UG59/U	2.75	UG242/U	2.50
UG59A/U	1.70	UG243/U	2.75
UG60/U	1.90	UG244/U	2.50
UG60A/U	1.30	UG245/U	1.25
UG61/U	2.05	UG246/U	1.45
UG61A/U	1.80	UG252/U	4.50
UG62/U	28.00	UG254/U	1.82
UG83/U	1.50	UG255/U	1.85
UG85/U	1.69	UG259/U	4.10
UG87/U	1.40	UG260/U	.99
UG88/U	1.17	UG261/U	.95
UG89/U	.95	UG262/U	1.05
UG90/U	1.05	UG269/U	2.60
UG91/U	1.25	UG270/U	6.50
UG91A/U	1.05	UG273/U	1.50
UG92/U	1.10	UG274/U	1.98
UG92A/U	1.35	UG279/U	2.40
UG93/U	1.25	UG287/U	5.25
UG93A/U	1.45	UG290/U	.85
UG94/U	1.25	UG291/U	1.05
UG94A/U	1.05	UG306/U	2.03
UG95/U	1.10	UG333/U	4.70
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UG96/U	1.25	UG352/U	6.00

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MORE AND MORE
YOU HEAR:

Yes, more and more you hear airline purchasing agents, airport operators and private owners saying, "We're Usin' Van Dusen." They know that for 10 years Van Dusen has made it a point to handle only quality supplies at the right prices and always with prompt, friendly service.

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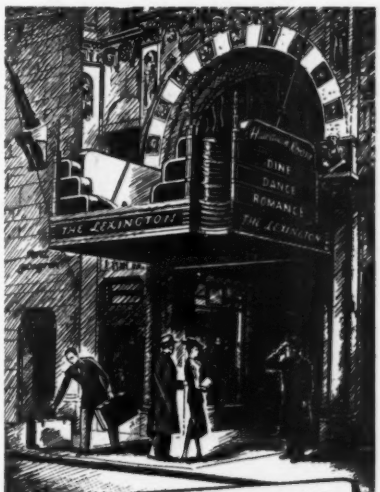

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OF AVIATION EXECUTIVES

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LEXINGTON AVENUE AT 48th ST., N. Y. C. 17
HOME OF THE Hawaiian Room
CHARLES E. ROCHESTER, President
George W. Miller, Resident Manager

EDITORIAL

Air Marking & Civic Pride

"Thank God for the air markings," were the first words of a Navy jet fighter pilot to his rescuer after a crash landing recently.

B. L. Kay, owner and operator at the small airport near Greenfield, Ohio, pulled Lieut. Comdr. John S. Hill from his F9F, bundled him into Kay's own plane, and rushed him to a hospital at Columbus, for which he received a commendation from the Navy Department.

Mr. Kay said the pilot had encountered bad weather, was off course, his fuel was running low, and when he saw an air marking on the roof of a Greenfield warehouse he decided against trying to reach Columbus, and came down on the short rough runway.

"In that case," the Greenfield Daily Times reported proudly, "the air markings more than paid off."

Blanche Noyes, that tireless missionary of air marking, is rightly proud too. She writes us:

"While hundreds of service men have told me of their becoming lost and being saved by an air marking or crash landed their planes due to the lack of air markers, this is the first time in several years that a military pilot has expressed his appreciation via the press. This marker was constructed to match markers which were installed by CAA with funds which were appropriated by Congress in our 1947 budget.

"We are very proud that we have been able to have 4320 air markers installed as a result of the $100,000, our only appropriation for the actual construction of air markers since World War II. It has been proven that air markers are used not only by private flyers but by 500 mph. pilots of military planes so that the $100,000 which was appropriated by Congress has more than paid for itself in the lives and equipment that the markers have saved."

But Mrs. Noyes reminds us sadly that there are no more federal funds for material, and the entire air marking program has bogged down. Strangely enough, civic groups, flying organizations, and the like, who were willing to construct the markers when materials were furnished have lost their interest.

How can it be that a nation so proud of its fine highway system and with such understanding of the value of the thousands upon thousands of state and federal road markers, can fail to realize the vital need even for one air marker in each small community?

On the highways markers are conveniences, and we demand them; to the airmen they frequently mean the difference between life and death.

Civic pride alone, it seems to us, should demand adequate air markers in every city and town.

We Americans are funny people. We export billions of dollars for the recovery of Europe, and feel we are humanitarians, but we let our own flyers lose their way and needlessly crash and die in our own neighborhoods for lack of simple air markers costing a few dollars.

The Rails Are Wary

About 60 eastern railroads have pleaded with the Interstate Commerce Commission for higher passenger fares. They want to raise the basic coach rate from three cents a mile to about 3.38 cents. First class fares would be lifted from four cents a mile to 4½ cents. Traffic is declining.

Tie this action with the railroads' growing boldness in their competitive slaps at the airlines in the advertisements and you can see what our railroad friends really fear. The new air coach phenomenon is drawing blood.

The rails are even going to expensive pains to point out that their coach passengers don't "ride in the baggage car." They refer to Northwest's combination passenger-express cabins with the ingenious folding seats.

The western roads may have junked all of those ramshackle combination baggage and passenger cars they had but we doubt it. We know for sure the eastern roads (and it is they who want the higher fares) are still using these combination affairs on their suburban "service" because we have to ride them on the notorious Long Island. If they went as fast as combination DC-4s, however, even the new fares the rails want would be bargains.

Aviation has tremendous inherent advantages of speed and economy if it is given the chance by management and government to develop its maximum public service. The railroads show by their bolder and bolder advertising that they realize this. At that, they are sharper than some people in aviation who are finding it easier to stand pat than to push ahead and experiment with better ideas.

Why Lawyers Love Aviation

It is obvious from the record that a group of the major scheduled airlines have turned once more to their lawyers to help fight the irregulars.

Six or eight of the large lines are mimeographing their intervention forms wholesale and loosing them on the Civil Aeronautics Board.

Time was when one carrier intervened against another only when he was directly affected.

Now we have Eastern Air Lines filing an intervention against Seaboard & Western, an overseas cargo carrier which cannot be said to compete with EAL. Eastern is also filing against carriers operating between the Pacific Northwest and Alaska.

Pacific Northern, an Alaskan carrier with an interline agreement with Pan American connecting at Seattle, files an intervention against the Virgin Islands Air Service and Caribbean American.

American and American Overseas are filing against Alaska carriers, and against East Coast and Caribbean non-skeds. American also goes to bat with Aerovias Sud Americana, Inc.

More and more it's a lawyer's war. All the public asks is better, cheaper service. ROBERT H. WOOD

Why Leading Aircraft Manufacturers

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CONSOLIDATED VULTEE'S L-13 LIAISON AND AMBULANCE PLANE
and other modern military aircraft have enclosures of Du Pont "Lucite"* acrylic resin. Such enclosures are easy to install and maintain, and offer undistorted vision.

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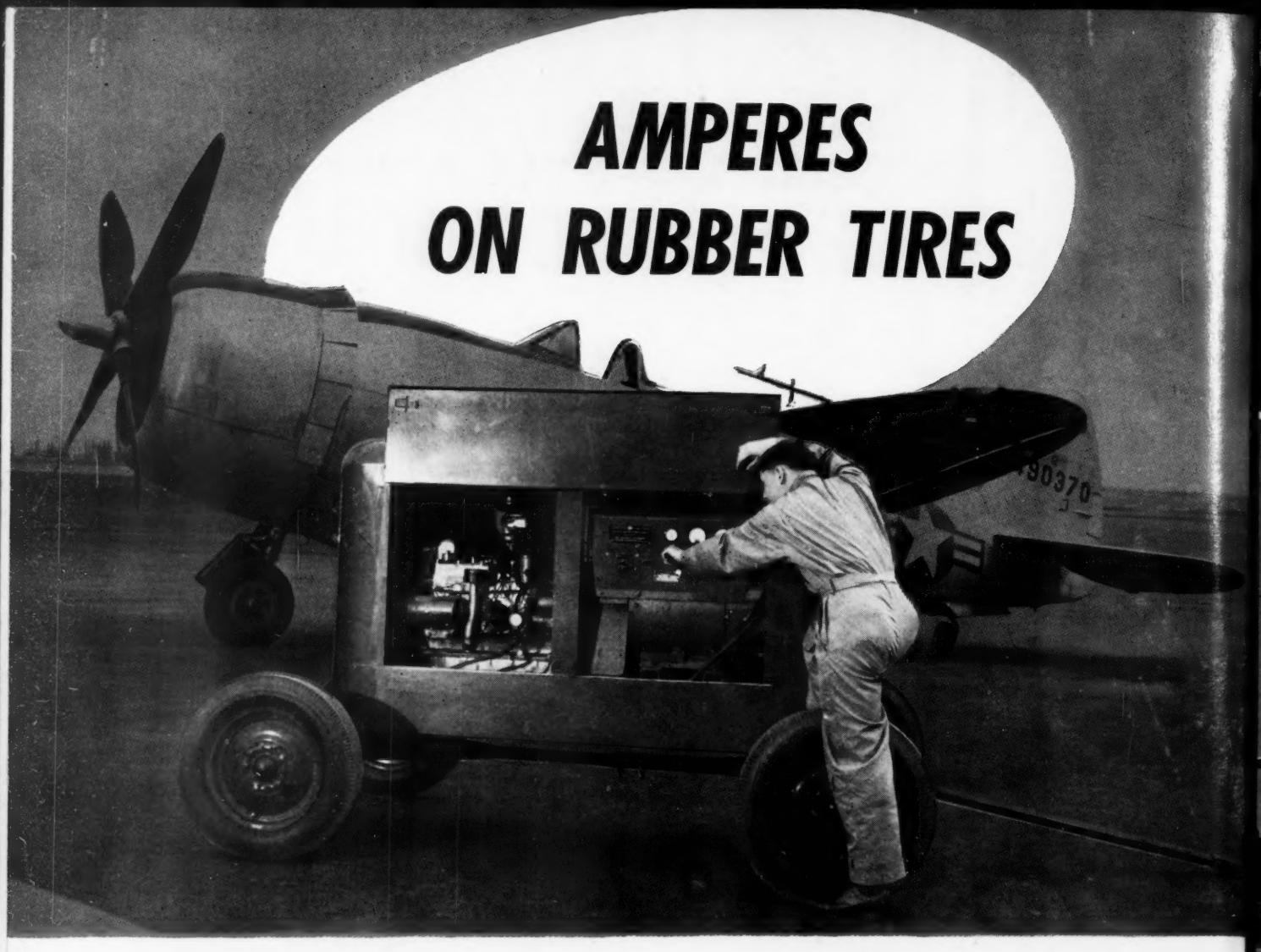

AMPERES ON RUBBER TIRES

This portable 500-amp aircraft energizer was developed a few months ago by General Electric engineers to furnish commercial and military air bases with a convenient 28½-volt ground power supply. The heavy-duty power source provides plenty of amps for starting jet and reciprocating engines, for pre-flight check of the aircraft's electrical system, for production tests in shop and hangar repair areas.

Mounted on wheels, the energizer can be furnished with either gasoline-engine drive mounted in a trailer (as in the photograph) or a-c motor drive mounted on a two-wheel dolly. The basic generator and control system is available also for "Jeep" mounting. The mobility of the unit permits faster takeoffs as well as strategic dispersal of aircraft during hostilities.

This power supply is one of many products manufactured by General Electric for the aviation industry. G-E engineers are continually at work designing new and better products to increase efficiency and cut operating costs. Get complete information on our aviation products from your nearest G-E representative. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

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